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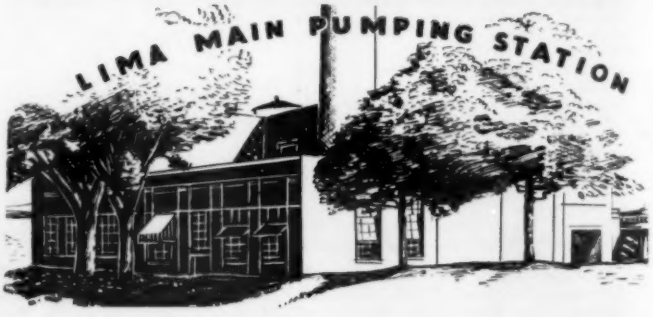
IN Lima

Situated on the Ottawa River, in the very heart of northwestern Ohio, Lima is a busy city of some 60,000 people. Incorporated as a city in 1842, with only 757 inhabitants, it became the county seat of Allen County. When the peak of production in the rich surrounding oil fields was passed, Lima concentrated its energies on manufacturing industries. In Lima today are made locomotives, steam shovels, woolens, motor trucks, electric signs, tobaccos, petroleum products, and many other items of industry.

The history of Lima's water supply is interesting. Begun in 1887, and owned since that time by the city, the system first made use of a small impounding reservoir on nearby Lost Creek. As demand increased with the population, wells were drilled and additional storage facilities were provided. A modern filtration plant was installed in 1919. Today the residents of Lima need have no fear of water shortage, for the system has adequate capacity to care for any and all needs.

Lima, another city using Pittsburgh Water Meters, is well below the State average for the net cost of water to its consumers.



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ATLANTA BUFFALO CHICAGO MEMPHIS
NEW YORK COLUMBIA KANSAS CITY PHILADELPHIA TULSA HOUSTON LOS ANGELES OAKLAND

PITTSBURGH WATER METERS

Federal Aid vs. Local Self-Reliance

Spending for the City of Today and Tomorrow

AS indicated on the front cover of this issue, THE AMERICAN CITY believes that the time has come for municipalities to discard their depression psychology. Much harm will be done if the craving for Federal aid generated by the recent lean years should persist needlessly in better times. The present need is a campaign of local education in most communities to show the voters that the wise and liberal spending of local tax funds is one of the best of possible investments.

As an example of one method of visualizing for the taxpayer the small cost of public services, ten sketches are reproduced on the front cover of this issue from the 1937 report of the City Auditor of New Rochelle, N. Y. The figures under these sketches show, for the services indicated, the *monthly* cost to a taxpayer whose property is assessed at $10,000 and who will pay in taxes for the fiscal year 1937 a total of $294, or $24.50 per month. The complete breakdown on an *annual* basis, for this average taxpayer, as reported to THE AMERICAN CITY by Paul A. Bankson, Assessor of the city of New Rochelle, is as follows:

TYPE OF SERVICE	PER ANNUM
Education—For the operation of schools: salaries, building maintenance, supplies, and interest and amortization on long-term school bonds	$70.85
Debt Service—For paying off municipal loans for civic construction projects	67.80
State and County Tax—Paid by the community for services rendered by the state and county	53.00
Police Protection	21.325
Fire Protection	17.35
Administration—To finance the controlling administrative and legislative departments	14.55
Welfare	12.85
Street Cleaning and Repair	12.20
Garbage Collection and Disposal	6.30
Recreation	5.60
Public Libraries	3.70
Sewage Disposal	1.75
Health	1.525
Miscellaneous	5.20

Assuming four persons in the taxpayer's family, the *per capita* annual costs would, of course, be only one-fourth of the foregoing figures.

PWA and WPA Activities to Be Curtailed

A SPECIAL reason for more liberal local spending is the reduced appropriation authorized by Congress for the 1937-38 fiscal year in the legislation approved by President Roosevelt on June 29, 1937, cited as the Emergency Relief Appropriation Act and the Public Works Administration Extension Act of 1937. These acts carry approximately $1,500,000,000 for WPA for the coming fiscal year. As stated in the *Federal-City News* of the United States Conference of Mayors:

"This amount will not be sufficient to take care of the present WPA load for the next twelve months. Reduction of quotas will be necessary—as a matter of fact, orders to reduce quotas have already been issued by Washington. . . . In general, the character of WPA work to be undertaken after July 1 under the new appropriation will be much the same as at present."

There is also made available $359,000,000 to the PWA for certain types of projects. These allotments will be on a 45 per cent Federal grant basis. Immediately following the enactment of this legislation, orders were issued to the PWA staff to accept no more non-Federal applications for allotments. Announcing this order, Administrator Ickes said:

"There remain pending sufficient filed projects in an advanced stage of preparation to be dealt with under the funds available through the Public Works Administration Extension Act of 1937. It is desired to save communities from incurring expense through civic, legal and engineering action on projects for which funds are not available."

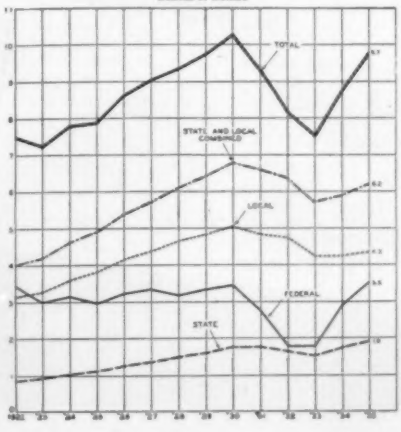
The extent of the emergency expenditures of the Federal Government for the last three fiscal years is shown in the accompanying table from the National Industrial Conference Board's 1937 report on "Cost of Government in the United States, 1934-1936." There is also reproduced from the same volume the chart showing tax collections, Federal, state and local, for the fiscal years 1922-1935.

TABLE 6: EMERGENCY EXPENDITURES OF THE FEDERAL GOVERNMENT, FISCAL YEARS 1934 TO 1936
Source: Annual Reports of the Secretary of the Treasury

Class of Expenditure	1934	1935	1936
Agricultural aid	$566,162,019	$279,572,585	$184,828,786
Federal Emergency Relief Administration[2]	707,352,344	1,820,903,937	406,591,987
Emergency conservation work	231,940,551	435,508,643	486,281,194
Civil Works Administration	805,122,992	11,327,364	676,196
Other relief	..	80,561,250	2,882,449
Works Progress Administration	..	..	1,263,861,490
Public works[2]	642,398,722	1,030,411,841	528,408,316
Aid to home owners	194,972,164	103,554,093	214,812,369
Reconstruction Finance Corporation	584,623,017	141,926,564[4]	238,722,417[3]
Miscellaneous	160,825,760	46,526,622	52,507,497
Total	$4,002,397,771	$3,636,529,671	$3,290,927,870

[1] Includes Federal Surplus Commodities Corporation.
[2] Excludes Works Progress Administration.
[3] Excess of credits, deduct.

CHART 4: TAX COLLECTIONS IN THE UNITED STATES, FISCAL YEARS 1922 TO 1935
Billions of Dollars



The upward trend of the latter indicates the dual possibility of an early balancing of the Federal budget and of an increased assumption by local governments of strictly local burdens. No authoritative figures are available as to local government expenditures for the last two fiscal years; but the Bureau of the Census figures for the 94 cities having a population of over 100,000 in 1934 show per-capita expenditures that year for all governmental-cost payments of $67.11, as against $82.68 in 1928. In so far as this reduction represents economies permanently desirable, it is all to the good; but much of the saving must reflect emergency budget cuts which might gradually be restored, to the public advantage.

Other Significant Data

THE need for a continuation of liberal spending for unemployment relief by all units of government is indicated by a National Industrial Conference Board statement, released on July 9, 1937. Though showing a reduction of more than 2,400,000 in the total number of unemployed in the United States between May, 1936, and May, 1937, the Board's figures estimate that in the latter month there were still 6,246,000 potential workers out of a job.

Especially important among recent studies of public spending is an article published in *The Architectural Record* for May, 1937, on "Federal vs. Local Public Works," by William Stanley Parker, of the State Planning Board of Massachusetts, and obtainable in reprint form from the Board's headquarters, Room 24, State House, Boston. Mr. Parker calls attention to the apparent lack of coordination and cooperation of local government programs with the Federal relief program during the past few years and the need of such coordination if a long-range program on a national basis is to be effectively developed. He adds:

"It is clear that any increased effort by the Federal Government can be completely nullified by a decrease in state and local expenditures which normally should be several times as great as those of the Federal Government. Any planned program must therefore involve the cooperation of all levels of government if it is to achieve its purpose. . . . It is therefore suggested that a broad program for the increase of state, county and municipal expenditures be devised and allocated reasonably to each group and elements thereof in the light of their known financial conditions, and that grants in aid be extended only to such units as agree to carry their share of the program."

Of much interest also, in this connection, is a study of "Federal Assistance to Municipal Recovery," by Wylie Kilpatrick, in the *National Municipal Review* for July, 1937.

"MIGHTY GOOD SERVICE WE'RE GETTING THESE DAYS"
BELL SYSTEM SERVICE IS BASED ON Western Electric QUALITY
The name "Western Electric" on telephone equipment means high quality at low cost. Your Bell telephone company, and every other Bell company, shares the benefits of its centralized manufacturing.
This has brought constant improvement in the speed, clarity and efficiency of the telephone—saved millions of dollars for Bell telephone users—and helped to give this country the best telephone service in the world.
ORGANIZED FOR SERVICE TO THE PUBLIC
The Western Electric Company is an integral part of the Bell System. Its purpose is to provide a dependable supply of telephone equipment of high quality at low cost. The Western Electric plan of centralized manufacturing and distributing has half a century of proved benefits behind it. The increasing use of the telephone and the need for continued progress make it more important to the public than ever before.
BELL TELEPHONE SYSTEM

Compulsory Motor-Vehicle Inspection

ONE of the liveliest stirs in many a moon occurred when the city of Memphis, Tenn., opened its Motor Vehicle Inspection Bureau in 1935. The idea was not a new one, and some states had required periodic inspection at designated garages for years; but for a city to tackle the job and do it successfully and with popular approval required energy and character, which were furnished by Vice-Mayor Clifford Davis of Memphis.

Now there are 12 cities conducting motor-vehicle safety inspection stations. What is this municipal job of compulsory motor-vehicle inspection? What does it accomplish? Should other cities operate inspection lanes? What's the low-down? THE AMERICAN CITY has gathered the facts which all cities want to know about periodic safety inspection of motor vehicles, as performed by six cities experienced in the work.

All these cities strongly recommend municipal inspection.

"It reduces motor-car accidents, makes the automobile driver more safety-conscious, and keeps all vehicles in a much better mechanical condition," says Benton Coe, Manager of the Des Moines Motor Vehicle Inspection Bureau.

"We feel that it is reducing our accidents," says Harry R. Burke, Director of Public Safety, Knoxville, Tenn.

"We have not only sold the car owners on the safety value of these periodic inspections, but we have endeavored to render a real service by inviting the car owner, after his car has been approved, to return any time during any current period, for reinspections without payment of further fees," says A. E. O'Brien, Superintendent of the Memphis Motor Vehicle Inspection Bureau.

"Drivers become more conscious of equipment defects, and numerous unsafe cars are forced off the streets," says Fred J. Manning, in charge of the Miami Motor Vehicle Inspection Bureau.

"It makes motorists safety-conscious, keeps unsafe cars off the streets, keeps vehicles in better mechanical condition," says Ned Bailey, Superintendent of the Omaha Motor Vehicle Testing Station.

"We believe that with vehicles maintained in a safe operating condition, the number of accidents is reduced," says J. Verne Savage, Superintendent of the Motor Vehicle Inspection Bureau, Portland, Ore.

FIVE LANES INSPECT 1,800 VEHICLES A DAY IN PORTLAND, ORE.

Thus the objectives and the results are the same at each of these bureaus. Exactly what compulsory motor-vehicle inspection is has been described in detail in both the current and the 1936 editions of The Municipal Index.

For example, at Des Moines, all cars are called in numerical sequence of their license numbers, beginning January 1 and July 1. These notices are post-cards mailed to the owners. A second post-card is mailed to the owner who does not appear, giving him three days to present his car or be listed for a traffic summons. About 75 per cent of the cars are brought by the owners, and 49 per cent of all the cars inspected are rejected on the first inspection for imperfect condition of the following factors:

	Jan. 1 to June 30, 1937 Number Rejections
Brakes	9,954
Headlights	9,299
Tail-light	3,720
Brake pedal	1,540
Hand brake	1,214
License plates	895
Horn	652
Clear vision	206

Although Des Moines inspects 400 cars per day, this is only at the rate of a car per 12 minutes for each inspection. Consequently, there is time for each driver to receive advice on keeping the car in good condition. This is an important element of successful inspection, which tends to put both the driver and his car "on their toes." Knoxville inspectors show him on his own car many of the things which cause accidents. Memphis distributes safety literature. Miami uses safety posters and printed messages.

The first step in the establishment of a bureau, says Burton Coe, of Des Moines, is to secure a state enabling act, and then obtain the backing of all civic organizations in the city. Give as much publicity as possible through cooperation with newspapers and good selling of safety ideas to all garages and service stations.

Knoxville "would certainly recommend a safety lane to any city; with 100 per cent inspection there is a record of every car involved in an accident; we tie this in with accident reports and drivers' permits."

At Memphis, buyers of used cars are now requiring dealers to secure current inspection stickers because, says A. E. O'Brien, "they know we will not approve anything for anybody that does not absolutely meet our requirements."

Cities desiring complete details of the operation of a municipal testing station should ask the Motor Vehicle Inspection Bureau, Memphis, Tenn., for the booklet it has prepared for just such inquiries: "Memphis, Tenn., Official Safety Inspection."

The booklet explains why Memphis passed its ordinance. In 1933 there were 50 fatalities out of 2,105 accidents; public liability and property damage insurance rates were the lowest in the state, and no increase was desired. An enforcement and educational program had been effective, and a new effort was deemed advisable. Most other machines are inspected, so the city decided to inspect motor vehicles.

INSPECTION STATISTICS OF SIX CITIES

	Des Moines, Iowa	Knoxville, Tenn.	Memphis, Tenn.	Miami, Fla.	Omaha, Nebr.	Portland, Ore.
Number lanes	3	1	3	1	3	5
Hours working day	8	8	9	9	10	9
Number inspectors	9	7	18	2-10	18	36
Cars inspected per day	400	200	950	1,400	400	1,800
Percentage owners bring cars	75	80	90	100	85	85
Rejected on first inspection	49	65	48	23	33	42

AN OPEN LETTER *to—*

Mr. Municipal Official:

You don't need an engineer to tell you that it is a good idea to use elevated water storage in your waterworks system. But if you are prudent, you will employ the best engineering talent available to determine how much storage you can use to advantage. . . where it should be located . . . and what type of tank should be used to provide it.

Occasionally you may have a water supply system with more storage than is needed but it is far more common to find systems that could use greater capacity to an advantage - both for reason of economy as well as for improvement of service. The cost of providing plenty of surplus capacity in any new elevated storage project invariably runs far below the cost incurred if additional capacity has to be added separately at a later date.

And location is important. A given amount of storage capacity may be adequate for a city. But if it is not located in the right place, serious impairment of service can result. Similarly, if the type of tank used is ill-suited for the job, its effective capacity may never meet requirements.

Good water service is a prize worth going after. That's why we urge that you avail yourself of the best counsel engineers can give you.

CHICAGO BRIDGE & IRON COMPANY
Builders of Horton Tanks

THE results obtained with the elevated tank installation pictured at the left are a testimony to the value of competent engineering counsel. This is a 1,500,000 gal. radial-cone tank built to the specifications of the Engineering Service Co., for the city of Aurora, Ill. We will be glad to tell you more about it.

CHICAGO BRIDGE & IRON COMPANY

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New York.....3308-165 Broadway Bldg.
Cleveland.....2236 Rockefeller Bldg.
Detroit.....1501 Lafayette Bldg.
Philadelphia..1616 "1700" Walnut St. Bldg.
Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 N. Fiftieth Street
Dallas.....1405 Liberty Bank Bldg.
San Francisco.....1033 Rialto Bldg.
Houston.....2919 Main Street
Tulsa.....1625 Hunt Bldg.
Los Angeles.....1403 Wm. Fox Bldg.

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water-Works Problems

Rapid Sand Filters Remove Cysts of Amoebic Dysentery

TESTS have been conducted recently on the removal of the cysts of amoebic dysentery organisms from water by rapid sand filters, using a filter 10 square feet in area. The work is recorded in *Public Health Reports* of the U. S. Public Health Service for November 13, 1936. It covers the work of two chemists of the Division of Water Purification, Department of Public Works, Chicago, John R. Baylis and Oscar Gullans, and Bertha Kaplan Spector, Associate Protozoologist, U. S. Public Health Service.

The filter had 24 inches of sand with an effective size of 0.5-mm diameter. The cysts were not in the water when it was coagulated, but were added to the coagulated water going to the filter. They were fed into the influent water at a constant rate from 5-gallon portions of a suspension of the organisms.

The number of cysts in the influent water varied from 362 to 2,370 per gallon of water. A total of 114 gallons of filtered water was tested and only four cysts were found. The percentage reduction was in excess of 99.99.

The duration of an experiment was from 3.7 to 13.7 hours. Nine to 74 liters of filtered water were collected at equal intervals during the period of the run. The filtered water collected for testing was first run through a Foerst centrifuge for concentrating the cysts. Prechlorinating the water did not affect the efficiency of the filters. The authors conclude that the filtration of water through rapid sand filters in the manner now extensively used throughout the United States is an effective means of removing Endamoeba histolytica cysts from water.

Tooth Enamel Mottled by Fluorides in Ohio

MOTTLED enamel in a mild form is endemic in Ohio, particularly in counties in the northwest section of the state. In a number of other states, the situation is far more serious. It has been definitely shown that this dental defect is due to the presence of fluoride in the water used for cooking and drinking, and that mottled enamel may be expected to develop if the water contains more than about 1.0 ppm fluoride. The problem is relatively new in the water-works field.

Recent studies by one of the authors of a paper, "Fluoride in Ohio Water Supplies," presented at the Sixteenth Annual Ohio Conference on Water Purification at Columbus, Ohio, indicates that by over-treatment with lime to a causticity of about 2 grains per gallon, in the presence of sufficient magnesium, between the limits of 1.5 and 3.5 ppm fluoride, the residual fluoride in the treated water is reduced to 1.0 ppm. The removal of fluoride in the above process varies as the square root of the removal magnesium. Under certain conditions in the presence of relatively high fluoride, the addition of a soluble magnesium salt is necessary.

With practically no modification, water-softening plants of the standard type are adaptable to fluoride reduction problems. Ordinarily, only the relatively small municipality is concerned with the removal of fluoride, inasmuch as the surface supplies of the larger population centers rarely contain fluoride in toxic quantities. In many instances the situation is reversed in the smaller communities which perforce depend upon wells for water supply.

For villages with a population of 1,000, the construction cost of a lime softening fluoride reduction plant is about $10,000. Operating costs correspond to those of a standard water-softening plant, increased, however, if the character of the raw water is such as to require the addition of magnesium to effect a sufficient reduction of fluoride. Initial operation should be entrusted to a skilled chemist, but when a proper chemical dosage has been developed, no greater attention is required when fluoride reduction is important than is necessary at the ordinary lime or lime-soda water-softening plant.

Operating results at the existing water-softening plants at Marion and Mt. Sterling and the recently installed plants at Alger and Baltimore, Ohio, confirm conclusions as to the efficiency of excess lime in the reduction of the fluoride content.

The problem of fluoride reduction, while relatively new in the water-works field, is of great importance in many sections of the country, and under no circumstances should a well supply be considered as a source of public water supply until definite knowledge is available as to its fluoride content. Fluoride problems require for solution the cooperative efforts of the dentist, the chemist, and the water-works engineer.

The authors of the paper from which this material was taken are: R. D. Scott, Chief Chemist, Ohio Department of Health; A. E. Kimberly, Engineer, PWA in Ohio; A. L. Van Horn, M. D., Chief, Bureau of Child Hygiene, Ohio Department of Health; L. F. Ey, Director of Laboratories, Ohio Department of Health; and F. H. Waring, Chief, Division of Engineering, Ohio Department of Health.

Damage to Meters from Hot Water

HAZARDS from overheating water are becoming more widespread in northern New Jersey, according to a report from the Hackensack Water Co. There is a growing tendency in the home and apartment houses to overwork or to neglect water-heating devices. The same general conditions are said to exist throughout the country. An organized effort to minimize temperature excesses is being made in the New England states under the auspices of the New England Water Works Association.

Investigation discloses that it is a common practice to carry the temperature of the water in the boiler higher and higher, thus increasing the danger from overheating. Corrosion and, not infrequently, the destruction of the boiler results.

Temperatures such as boilers are now forced to carry are unnecessary. Corrosion activity is doubled with every increase of 10 degrees in temperature. It is pointed out that damage from bursting boilers and replacements of boilers prematurely worn out by the corrosive action of unduly high temperatures will multiply unless existing excesses are curbed.

A survey of the 51 communities supplied by the Hackensack water system, embracing nearly 75,000 water users, showed that the chief causes of overheating were the hand-controlled gas heaters and oversized or improperly placed furnace-fire-box coils. While each of these appliances was responsible for an equal number of mishaps, the forgotten gas heaters with manual control create the greatest hazard of all. Oversized separate coal water-heaters, commonly known as "pot stoves," account for about 15 per cent of the difficulty.

"Rarely do we find this trouble with the better type of thermostatic gas control, but we advocate a temperature-limiting device on all hot-water systems except those in which indirect or secondary coils attached to hot water or steam furnaces are the sole water heating units," says the report of the survey made public by Earle Talbot, Vice-President, Hackensack Water Co.

"In this latter connection we have noted that the domestic hot water supply produced in a direct auxiliary in some of the latest makes of oil-burning heating and air-conditioning units is overheated in most cases due to the non-circulating hot water piping and an undersized tank."

High water temperatures explain why dwellers often draw hot water from the cold water tap. If the boiler is overheated, the water expands back toward the meter, and into the cold-water supply pipe. Any cold water tap within this range of expansion will then pour forth discolored hot water. Wherever the piping arrangements are peculiar, hot water can be drawn out of almost any cold water tap when the boiler is overheated. If the system is a closed one, hot water from a cold-water faucet is a danger signal.

New England Water Works Association Meeting, Poland Spring House, Poland Spring, Maine, Sept. 21-24.

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DOWN gleaming rails speed heavy freight and crack passenger trains—cargo carriers on the overland trails of commerce. But, before a wheel can turn, there must be water. And all along the routes there must be more and more water. Much of the water supply of America's greatest railroads is supplied by the famous Layne Pumps and Well Water Systems. And so goes that same story with many lines of industry and with hundreds of cities throughout the entire world.

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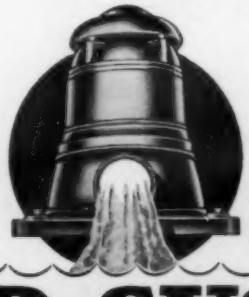

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Health and Sanitation

The New Sanitary Problem of Trailer Tourists

THE increasing popularity of the auto trailer, with the accompanying increase in the number of highway nomads, is causing many public health officials concern. Quite aside from the medical-social problems created by the presence of increasing numbers of all-year automobile tourists, there have arisen a number of specific problems. Foremost among these may be mentioned the matter of safe milk and water and the sanitary disposal of human waste. Fortunately, safe water is available along the highways in many states; and safe supplies are so well marked, supervised, and located that there is seldom an excuse for using a questionable supply.

With regard to safe milk the situation is not quite as favorable, though by no means generally dangerous. The wise trailer tourist will, of course, purchase pasteurized milk in a city or town through which he passes, keeping it cool, until it is consumed, in the small ice chest which is a feature of many of the new trailers. When pasteurized milk is not obtainable, he should protect himself by applying the knowledge that heating milk to a temperature of 142-145 degrees F. for 30 minutes will insure a margin of safety.

However, the chief source of concern, as outlined in *Public Health Reports* of the U. S. Public Health Service, is the unsafe or uncertain disposal of human excreta by trailer travelers, which may become a nuisance or a health menace.

As trailer accommodations have improved, provisions have been made for small toilet compartments in which excreta is deposited in cans containing chemical solutions reported to render the waste innocuous. This provision is, of course, highly commendable and constitutes a marked sanitary advance over earlier days when human waste was deposited rather promiscuously by the roadsides.

But a new complication now arises from the use of the can privies on trailers, for no extensive or satisfactory provisions have been made for the disposal of the wastes and the cleansing of the cans. Usually it is not practicable to dispose of the wastes in tourist-camp privies, in toilets of gasoline filling stations, or in the public comfort stations available in cities. To throw the excreta on the ground in the open country with the potential danger of contaminating a water supply or creating a nuisance is reprehensible.

It is felt that serious consideration must now be given to providing roadside facilities for the sanitary disposal of human waste from auto trailers. Possibly state or county departments of health could construct disposal systems near roads frequented by auto trailers. Here could be located a combined comfort station and place for the disposal of excreta. The location of such places could be made known by appropriate road signs. Not only would such facilities be greatly appreciated by the occupants of trailers, but the opportunities for the creation of nuisances would be materially lessened, and potential menaces to the public health would be definitely removed.

The matter is believed to be of sufficient importance to warrant the earnest attention of health officials, automobile associations, and trailer passengers themselves.

The Health Department Always Gets You

A SLIGHTLY different approach to the work of a municipal health department appeared in an issue of the the *Municipal Booster*, published by the Municipal Employees Club of the city of Fort Wayne, Ind. It states:

"Few people realize that the Health Department with its small budget of $34,000 is the one department that follows the individual from the day he is born until the day of his death. The birth certificate, which the Health Department files, is a most valuable document because it proves one's age for working, voting or driving a car, his right to an inheritance and his rights as an American citizen when abroad, as well as many other things. Through the examination and inspection of water, milk, food, grocery stores, meat markets, the removal of unsanitary conditions and the quarantining of contagious diseases, each citizen is protected from preventable diseases as far as possible. When he dies, his death certificate is filed. This is silent evidence of the right of his relatives to receive insurance money or any other monies left behind by him. Each day the Health Department watches over every citizen so that he or she may not only live longer but better."

Health Indices

THE purpose of public health statistics may be said to be threefold. They should enable us to: (1) measure the state of health of a community in all its aspects; (2) appraise the activities undertaken for the protection of the community health; and, (3) obtain indications concerning the relationship between the state of health and environmental factors, whether natural, social, or resulting from specific health measures.

The first point has hitherto received much the largest share of attention. Beginning with statistics of births and deaths more than a century ago, this type of information has slowly spread to statistics of causes of death and of the prevalence of epidemic diseases, tuberculosis, venereal and occupational diseases. In recent years, the general morbidity statistics have received considerable attention, the approach having been partly through general sickness surveys and partly by analysis of the records of national health insurance systems. This development has been due largely to a growing interest in the problem of medical care and to an increasing recognition of the fact that mortality statistics alone are insufficient as indices of the state of public health.

Any system of indices devised to furnish precise and objective information on the state of public health and the factors which influence it must cover a very wide field. It cannot be limited to subjects and activities for which only the health department is responsible. If, in the future, it should become desirable to widen the scope of official public health work, its proper administrative expression will be found in due time. In the meanwhile, there can be no objection to the pooling and collective analysis of information concerning any conditions or activities which may have a bearing upon the public health, just as there have been no objections to the publication of extracts of all national statistics in statistical handbooks.

A growing tendency to widen the scope of public health conceptions has been clearly evident in European countries for several years. The questions of adequate medical care, especially for the part of the population which, for lack of sufficient resources, does not always obtain it, is at present one of the most important problems under discussion. Adequate housing accommodation is essential to healthy living, and interest in this problem is rapidly growing in the public health profession. Our knowledge of the elements of nutrition has been greatly enriched in recent years, but next to nothing has been done to bring this knowledge effectively and practically to that part of the population which, on account of its limited resources, needs it most.

These are the outstanding new problems with which the public health profession is now concerned, but there are many others, notably in the fields of industrial hygiene, mental hygiene, physical examination, and physical education. Even the accident problem—whether industrial, traffic, or general—is one of direct and frequently growing concern to public health.

In order that this information should not become too unwieldy, it is desirable that: (1) it should be logically classified; (2) the most essential and characteristic parts of it should be extracted from the mass of specialized reports; and (3) such information should be currently published in one place, so as to allow a convenient appreciation of the health situation as a whole. This is what the present system of health indices proposes to do.

—From an article, "Health Indices," pages 5-36, *The Milbank Memorial Fund Quarterly*, January, 1937.

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No matter how extreme the punishment, these three great Goodyears will outperform from the start—keep going long after ordinary tires have been discarded.

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For example, the All-Weather Dump Truck Tire (1) is recommended for all-around dump truck work; the Pneumatic Lug Tire (2) where loose stones, sharp tread-wearing rocks are encountered; the Sure-Grip (3) for the mud, sand, soft-going.

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Municipal Airports and Aviation

Cities Seek National Airport Program

THE tremendous growth reported by the aviation industry in air passenger and express traffic, and announcement of the forthcoming new 80,000-pound planes, spur the efforts of the country's municipalities in their drive for a uniform planning and development of airports. The cities have a real stake in the program. Thirty-six of the nation's average-sized cities have invested $54,198,614 in their airports, and expend annually $1,550,087 to maintain them.

The immediate necessity for a national program sharply defining the authority and responsibility of city, state and Federal governments in the future airways program was discussed at last month's Chicago meeting of the Executive Board of the American Municipal Association. The A.M.A., federation of the state leagues of municipalities, represents nearly 7,000 cities.

Information thus far compiled in a study by the Bureau of Air Commerce of the Department of Commerce reveals that municipal funds spent for ground facilities in the development of air commerce probably will exceed all other expenditures for the purpose. Airports still are far from self-supporting. A survey shows that Cleveland, Ohio, has the highest capital investment in its airport, $5,800,000; and Medford, Ore., with $128,134, the smallest, of 36 average cities. Of the cities studied, the Pittsburgh-Alleghany port has the highest yearly operating expense, $237,283; and Springfield, Mo., the smallest, $6,485.

The function of an airport is viewed as covering several phases: first, its local use; second, its service in interstate commerce to a population in an area sometimes ranging from 50 to 400 miles in radius; third, its value for national defense purposes.

To show the added demands on airports, A.M.A. presents the following data from reports on the aviation industry:

1. Passenger traffic increased approximately 23 per cent last year, and express traffic about 100 per cent.
2. The jump in pilot licenses indicates large future increases in numbers of planes in use.
3. Airplane mileage flown has increased about 200 per cent.
4. Frequency of schedules has shown a marked rise.
5. Airplanes in construction are to weigh 80,000 pounds, and the industry is designing planes to weigh 160,000 pounds.
6. Airmail has shown increases, which will undoubtedly be much greater with changes in rates, etc.

The cities want to know: How will the costs of the imperative airport improvements be distributed so that each governmental beneficiary of the airport system pays its fair share? And how will the airports be governed? The general consensus seems to be that the states should have local supervision and policing of air transportation, and the designing, construction and maintenance of airports; but that it is essential that the Federal Government, with its licensing powers of ship, pilots and airports for the National Civil Airways and interstate service, first make complete plans to which the states and municipalities may gear their plans.

The American Municipal Association report shows that the following widely-scattered cities exemplify the improvement needed in most municipal air terminal facilities:

Chicago, Ill.—This airport, second busiest in the U. S., with traffic density as high as 200 arrivals and departures a day, has its operations confined to one-quarter section with an extension of the east-west runway to approximately a mile. The city faces necessity for immediate expansion to handle increasing traffic and meet Government regulations.

Newark, N. J.—Needs immediate expanding of area and more hard-surface runways. A part of the work has been started under WPA.

Camden, N. J.—Serving Philadelphia, this field may be inadequate for future operations, and construction of new air terminal is foreseen.

Louisville, Ky.—Hard-surfacing of runways needed.

Indianapolis, Ind.—Runways need lengthening.

Albany, N. Y.—Further expansion and runway construction necessary.

St. Paul, Minn.—Future expansion needed to meet Government requirements.

Cleveland, Ohio.—Further development necessary, supplementing WPA work.

El Paso, Texas.—Hard surfacing necessary.

Jacksonville, Fla.—Further expansion and removal of obstructions needed.

Albuquerque, N. Mex.—Entire new field necessary.

Improvements for Chicago's Municipal Airport

A WPA project has been set up and submitted to the State Administrator's office in the amount of $2,925,000 to include a continuation of the paved runways at the Chicago Municipal Airport to connect with the present runways, which have been partially completed through a WPA project amounting to $2,134,000, allotted in 1935.

A PWA project has been set up and submitted to the PWA State Office in the amount of $1,527,000 to purchase the right-of-way at 54th Street adjacent to the Indiana Harbor Belt Railroad track, and the construction of a new right-of-way to accommodate the Chicago Belt Railroad Co. Also, a new Administration Building with an area of 100,000 square feet, including the necessary waiting room, ticket office, post office, express office, restaurant, rest rooms and executive offices, will be built. A municipal hangar which can be rented by the city of Chicago to individuals for the purpose of obtaining additional revenue is included also in the program. New and up-to-the-minute field lighting and radio control equipment will be purchased and installed.

The WPA and PWA projects together amount to $4,452,000, and approval of both projects will be necessary to complete the work, which will create in the city of Chicago the largest, safest and most improved airport in the United States. When complete, the shortest effective length of any one runway will be 4,900 feet, and the longest effective length of any one runway will be 6,600 feet. The project also includes the necessary buildings, fencing, landscaping and fire protection to take care of increasing air line traffic for an indefinite period.

WALTER WRIGHT,
Supt., Parks, Recreation and Aviation.

Trans-Pacific Planes Increase Disease Danger

ACCORDING to a United Press dispatch, every trans-Pacific plane now arriving in Hawaii from either direction, in addition to its regular inspection, is fumigated and disinfected within a half-hour after it reaches port and also just before it sails for the next lap. According to Dr. Frederick E. Trotter, President, Hawaiian Board of Health, "The Territory of Hawaii has become, with the establishment of air routes, more than ever the American health frontier as well as the outpost for military defense. Authorities here must be constantly alert to prevent communicable diseases from entering the United States from the various Pacific countries. Since ocean travel has been reduced from days to hours by plane, the task of guarding the border against germs becomes greater."

Dr. Trotter explained that mosquitoes, which carry diseases, are easily transported by plane, while other plagues such as smallpox, which takes two weeks to develop, are more easily detected on a steamer than on the faster air liners. It is interesting to note that the popular play of only a few years ago, "Yellow Jack," which is also available in book form, stressed the part which airplanes can play in the transporting of virile disease germs from distant points to vast centers of population where the absence of that kind of disease prior to that time, with the absence of natural immunities and serums, sets the stage for possible disastrous epidemics.

Progress in Air Marking of Cities and Towns

THE Bureau of Air Commerce has recently announced the progress which has been made in securing a nation-wide marking of towns and cities for air traffic. Of the Government-sponsored air markings, some 10,000 are either completed or under construction. Aside from the towns which the Government, through appropriation, was able to assist in this undertaking, various civic organizations have contributed their time and money toward assisting the Federal Government in its plan to have every town and city adequately air marked.

Vitaguard Fire Alarm System for Volunteer Fire Departments

STREET FIRE ALARM BOXES PROPERLY DISTRIBUTED WITH REFERENCE TO FIRE HAZARDS PROVIDE THE MOST RELIABLE AND ACCESSIBLE MEANS OF TRANSMITTING ALARMS TO THE FIRE DEPARTMENT

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Public Safety

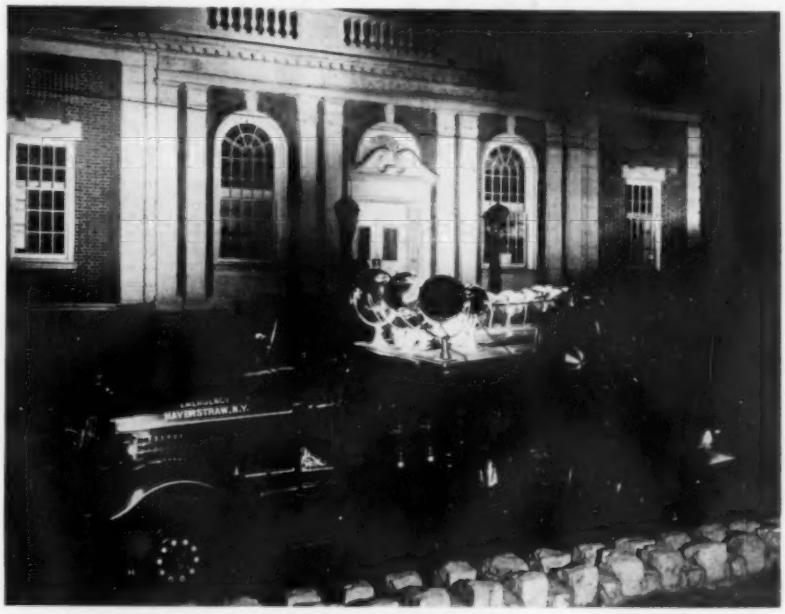
Haverstraw's Emergency Truck Has Bright Lights

HAVERSTRAW, N. Y., has an emergency fire truck which carries, in addition to rescue equipment, three 500-watt and two 250-watt General Electric floodlights attached to cable reels to give mobility. This lighting equipment is a tremendous aid in fighting night fires. Seeing prevents putting too much water on the roof, with the possibility of floors collapsing, and of having to wade through floods.

This is a 6-ton truck powered by a 6-cylinder, 150-hp motor, twin-ignition and streamlined, with two rear seats to accommodate 12 of the 20 men of this company. All the men carry first-aid cards, and the truck is equipped with H-H inhalators, CO_2 extinguishers, stretchers and first-aid equipment.

It is one of five pieces of apparatus in this community of 5,300 persons. The other trucks are two 1,000-gallon pumpers, one 250-gallon pumper, and a city service hook and ladder soon to be replaced by a 75-foot aerial. All apparatus is of Seagrave make.

HARRY JOACHIM,
Chief, Haverstraw Fire Department.



FLOODLIGHTS OF HAVERSTRAW'S EMERGENCY TRUCK

Give the Fire-Alarm Superintendent a Hand

MAKE plans and build your fire and police communications against the possible day of catastrophe, was the three-day theme of the third annual convention of the Associated Municipal Signal Services, at Elizabeth, N. J., June 28-30. George H. Bowen, Secretary, Boston Automatic Fire Alarm Co., is Chairman; E. P. Cochran, Retired Superintendent of Fire Alarm of New Haven, Conn., is Vice-Chairman; W. F. Franklin is Acting Secretary.

The keynoter was A. C. Hutson, Assistant Chief Engineer of the National Board of Fire Underwriters. All signal services in catastrophes have failed at one time or another, said Mr. Hutson, and though some of these disasters are infrequent and erratic, and others, like floods, are inevitable, all or any may strike anywhere some time.

In such a crisis the job of the municipal signalman is to keep the system operating. He can do this only if he has foreseen the practical aspects of the emergency and has prepared a plan that will work. To do this effectively he must have a reasonable degree of support from his city government, for a good communications system, which costs some money, is more likely to remain in service than one that is obsolete, incomplete and poorly constructed. And the best plan that experience and enthusiasm can devise is of small use when a sleet storm is in contact with overhead lines.

Some officials place planning for catastrophes in the category with fortune-telling. But there is no guesswork about what must be done when these floods, conflagrations, earthquakes, and appalling storms come. The trouble areas must be accurately known and their movements continuously reported to a central point from which orders must be issued—and reach the affected zones.

How much duplication of signal work must a city provide? The answer is: "All it can pay for and operate." For each has its special and particular value. Shall we drop out the code systems, the fire alarm and police telegraph, and place full dependence on the telephone, teletype and radio? All signalmen answer No; that, useful as these means of communication are, the direct, laconic code signal is essential to municipal signal operation.

E. A. Faller, fire-alarm expert of the New York City Fire Department, presented in detail in an article the policy of adequate fire-alarm services set forth by Mr. Hutson.

Emergency Lighting

IT is to study accident situations growing out of inadequate lighting, and to set up techniques for their prevention, that the Light for Life Foundation, Inc., has been established, with headquarters at 122 East 42d Street, New York. The Foundation will be concerned with all phases of the promotion of safety through emergency lighting.

To help in obtaining, at the outset, the interest of the public, the Foundation announces a series of awards to be conferred in outstanding cases where lives are saved or accidents prevented by the use of emergency lighting equipment. In a majority of the cases, the awards will consist of certificates and citations, with or without cash prizes.

The task of directing the many safety activities of the Foundation has been placed in the hands of a Board under the chairmanship of the undersigned. Funds for the Foundation have been unconditionally supplied by the National Carbon Co., Inc.

F. S. LLOYD,
Professor of Education, New York University.

Police Personnel in New York Cities

OF sixty cities in New York State, fourteen have assistant chiefs of police, and two of these cities have two assistant chiefs—Little Falls and Syracuse. This information and what follows is in a recent report of the N. Y. State Bureau of Municipal Information. Policewomen are employed by Buffalo, Jamestown, Mt. Vernon, New York, Oneonta, Poughkeepsie, Rochester, Syracuse. The use of park police is reported by Buffalo, Glens Falls, Newburgh, Oneonta and Rochester. The total force in the larger cities is: New York, 18,373; Buffalo, 1,166; Rochester, 430; Albany, 335; Syracuse, 326; Yonkers, 274; Troy, 179; Utica, 167; Schenectady, 166. Four cities in the 30,000-population class have total forces as follows: Amsterdam, 34; Auburn, 45; Newburgh, 48; White Plains, 77.

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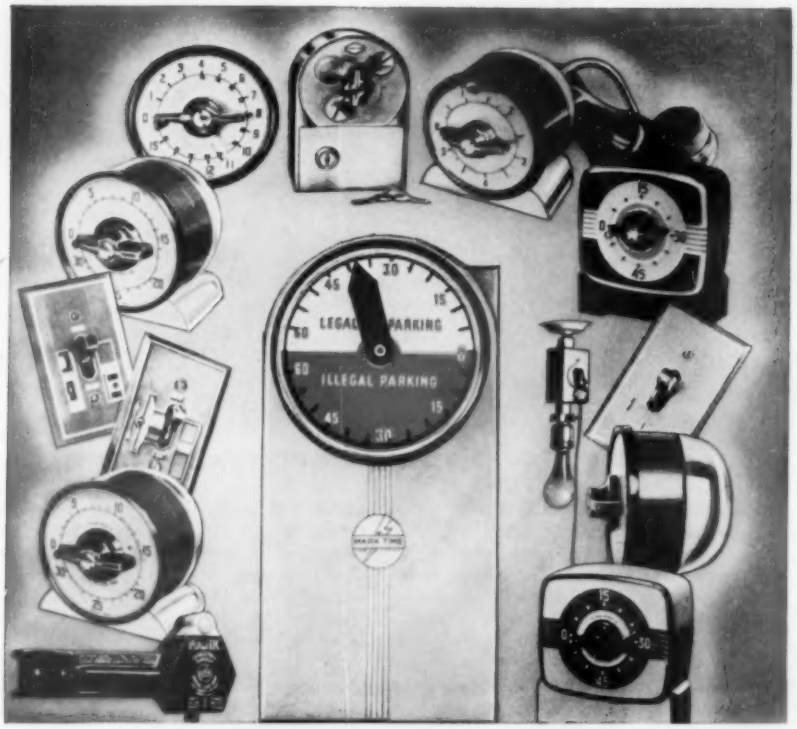

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City officials who select the MARK-TIME Parking Meter are invariably gratified to find a responsible, nationally known organization of timing specialists —in fact, the world's largest *exclusive* manufacturers of timing devices.

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The MARK-TIME Parking Meter, therefore, is but a logical development of its timing business. MARK-TIME is not in the parking meter field as a promotional gamble, to be here today and gone tomorrow. MARK-TIME *had* to produce a mechanically perfect meter, as a worthy companion-product of its famous line of timing devices.

Unlike ordinary parking meters, MARK-TIME Parking Meter is not an "assembled job". It is built "from the ground up"—manufactured, sold and serviced solely by the MARK-TIME organization—which stands squarely in back of it and guarantees its performance.

You can't be too careful when you select a parking meter for your city! For, the success or failure of the metered system of parking control depends largely upon the efficiency of the meter—and how that efficiency is maintained.

Your parking meter system will be no stronger than the company behind it! When your city is ready to pick a meter, find the answer to these three important questions: Ask who *makes* it—Ask who *sells* it —Ask who *services* it ! !

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MARK-TIME PARKING METERS

AUGUST, 1937

Vol. LII, No. 8

The American City

470 Fourth Avenue
New York

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MODEL OF $4,875,000 WATER-PURIFICATION PLANT NOW UNDER CONSTRUCTION ON MILWAUKEE'S LAKE FRONT

Milwaukee's Lake-Front Accomplishments

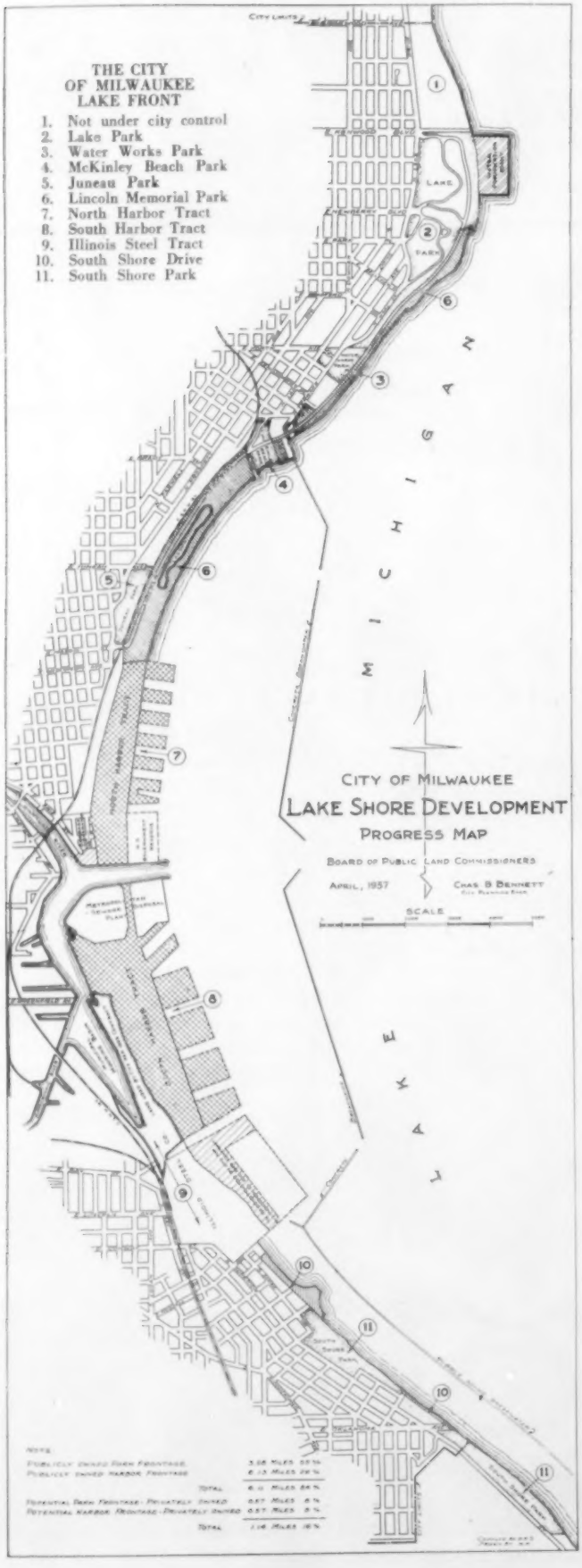
By CHARLES B. BENNETT
City Planner, Milwaukee, Wis.

IT IS said that a man is as big as the things he appreciates. If this is true, then the citizens of Milwaukee are entitled to a great deal of credit for an early and continued appreciation of one of Nature's greatest gifts to mankind—a magnificent location on one of the finest bodies of fresh water to be found in the United States.

The waterfront bay at Milwaukee has often been said to rival the Bay of Naples for beauty. As motorists approach the city from the south along the lake shore highway, there is suddenly unfolded a breathtaking picture of the waterfront with a skyline view of the buildings in the central business area. No matter how often one sees this picture, it never fails to inspire appreciation for the gifts of Nature—with mixed feelings, perhaps, as to these works of man.

Unfortunately, in the hasty development of our American communities there has too often been a complete lack of appreciation for Nature's endowments—which a little foresight and planning could have preserved and developed into assets of extreme value. While many mis-

A MIDSUMMER DAY AT BRADFORD BEACH ON LAKE MICHIGAN, AT MILWAUKEE



takes have been made in the development of the city of Milwaukee, the citizens and public officials must be given credit for their early understanding of the inherent beauty and potential value of the waterfront.

Twenty-six years after the city was incorporated, in 1846, Water Works Park, comprising 14.77 acres, was purchased on the lake front for the erection of a pumping station. The estimated land value of this site today is $650,000.

Between the years 1872 and 1884 the original Juneau Park tract, containing 13.75 acres, was purchased, the estimated value of which is today $620,000. In 1927 an additional 7.13 acres was purchased at a cost of $670,540.

Between the years 1890 and 1892, 125.20 acres were purchased for the development of Lake Park. This tract cost $270,875.

In the year 1897 the Chicago and North Western Railway Co. donated 5 acres of lake-front land to the city for the construction of a flushing tunnel intake and McKinley Beach Park. Today's estimated value of the land is $220,000.

Beginning with the year 1901, the city entered into negotiations with abutting property owners for riparian rights needed to construct Lincoln Memorial Drive from East Mason Street to Lake Park, a distance of 3½ miles. The Chicago and North Western Railway Co. gave its riparian rights to the city gratis, as did several other property owners. The land reclaimed through filling-in for the construction of the Drive, and park lands immediately adjacent, comprise about 102 acres. The estimated cost of the reclamation work and purchase of the land is $1,150,367.

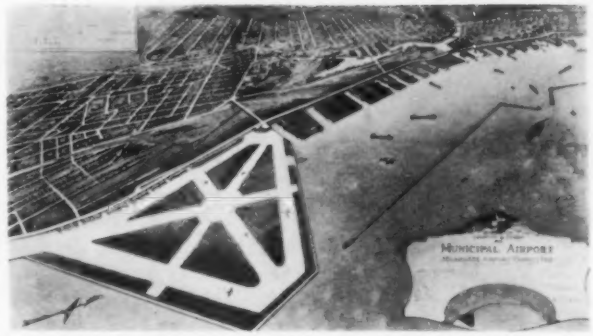
Between the years of 1909 and 1927 the city of Milwaukee acquired 28.22 acres of land at a cost of $261,985 for the development of South Shore Park. In 1929 the county deeded to the city 31.55 acres which it had purchased in 1925 at a cost of $84,333. This tract is considered a part of South Shore Park.

With the exception of a very small piece of property immediately south of East Russell Avenue, all the property owners from East Russell Avenue south to East Oklahoma Avenue have deeded their riparian rights to the city. The land reclaimed to date by filling in comprises approximately 9 acres and cost $38,000. Work was started on this project in 1913.

The North Harbor tract, located between East Wisconsin Avenue and the harbor entrance, set aside for commercial purposes under the jurisdiction of the Board of Harbor Commissioners, was developed by filling-in approximately 77 acres of land. The Chicago and North Western Railway Co. deeded its riparian rights to the city in exchange for a small strip of land immediately adjacent to its right-of-way. The work was started in 1917 and is now complete up to the bulkhead line. The United States Government has reserved an area of approximately 19 acres of submerged land beyond the present bulkhead line. Negotiations for riparian rights were begun in 1913.

The South Harbor tract lies between the harbor en-

trance and the extension of East Bay Street. The negotiations for the acquisition of this property were begun about the year 1917. Most of this land, along with the riparian rights, was purchased by the Metropolitan Sewerage Commission for its disposal plant. With the exception of that used by the Sewerage Commission, all the rest of this property is under the jurisdiction of the Board of Harbor Commissioners and reserved for shipping facilities and industrial uses. The Harbor Commission has constructed a mooring basin, railroad facilities, transit sheds, car-ferry slip, and piers for the handling of water shipments into and out of the city of Milwaukee.

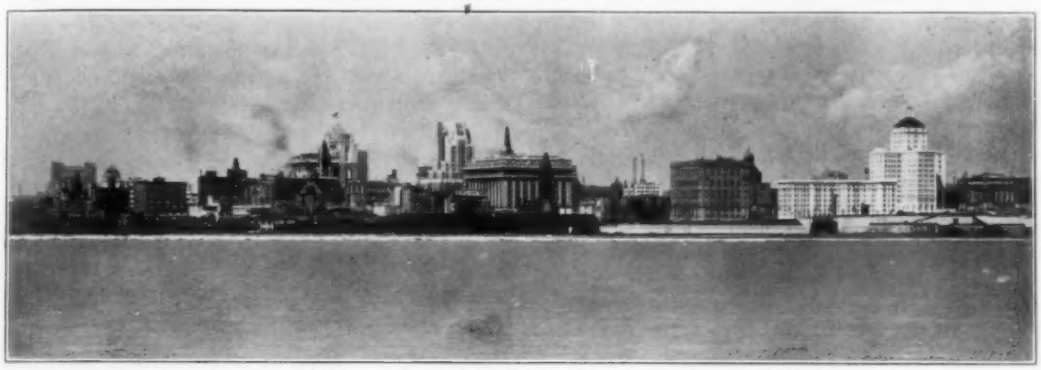


PERSPECTIVE VIEW SHOWING HOW THE SUGGESTED MUNICIPAL AIRPORT WOULD FIT INTO THE WATERFRONT IMPROVEMENT PLAN

Present Ownership and Future Plans

Out of a total of 7.25 miles of Lake Michigan water frontage, the city now owns 3.98 miles for park and recreational purposes (on January 1, 1937, all city-owned park lands were deeded to the county government for maintenance and operation by the Milwaukee County Park Commission), and 2.13 miles for commercial and industrial purposes under the jurisdiction of the Board of Harbor Commissioners. It is the intention of public officials to acquire at some future time the riparian rights on the 0.57-mile of frontage north of Lake Park now developed for high-class residential use. The other 0.57-mile of frontage, now owned by the Illinois Steel Co., lying immediately south of the South Harbor tract, has been negotiated for from time to time, but because of a difference of opinion as to the value of this property negotiations have never been completed.

It has been suggested that, if the city does acquire the Illinois Steel Co. property, there would exist a wonderful opportunity for the development of a combination land and seaplane airport on the lake front within a few minutes' drive of the central business district. An area comprising approximately 200 acres could be filled-in out to the outer breakwater, permitting the construction of runways ranging from 2,500 to 4,000 feet in length. Such an airport would place Milwaukee in the front rank in aviation facilities, and this activity could be tied-in with the water and rail transportation facilities now being developed by the Board of Harbor Commissioners.



SKYLINE VIEW OF MILWAUKEE'S CENTRAL BUSINESS AREA, TAKEN FROM LAKE MICHIGAN

AERIAL VIEW OF THE NORTH AND SOUTH HARBOR TRACTS, SHOWING THE SEWAGE-DISPOSAL PLANT AT THE HARBOR ENTRANCE AND THE ILLINOIS STEEL COMPANY PROPERTY IN THE LOWER FOREGROUND

The city is now constructing a $4,875,000 water purification plant on 24 acres of filled-in land immediately east of Lake Park. When it is completed and in operation, citizens of Milwaukee will enjoy an unlimited supply of pure drinking water.

A strong sentiment is developing for the extension of Lincoln Memorial Drive from its present southern terminus at East Mason Street south across the North and South Harbor tracts to South Shore Park. If this proposal is carried out, the southeastern section of the county, now lacking adequate highway facilities to the central business district, should enjoy a rapid growth in development.

Milwaukee is justly proud of its waterfront accomplishments and will undoubtedly continue the policy of eventually acquiring every foot of lake-front water rights for the use of its citizens.

Cleaning the Streets of Chicago

By JOSEPH J. BUTLER
Superintendent of Streets; Assistant Commissioner of Streets and Electricity

THE function of the Bureau of Streets of Chicago, Ill., is to maintain the streets and alleys in the best possible condition. To accomplish this object, the Bureau is divided into three principal divisions, comprising approximately sixteen wards each, and several subsidiary divisions within the wards. Each division is under the supervision of an Assistant Superintendent, and the wards are supervised by a District Superintendent. The subdivisions of a ward are supervised by a Section Foreman.

This Bureau is responsible for the cleaning of streets and alleys, removal and disposal of garbage and other refuse, maintenance and repair of pavements, the exercise of supervision over all work done in the streets and alleys by city departments, corporations and individuals, all of whom must procure permits before they may place any material in, or do any work in, any public street or alley.

The activities of this Bureau probably affect more closely, more continuously and more intimately the daily routine life of the people of the community than those of any other branch of our city government.

The Street Cleaning and Waste Disposal Division

Among the most important duties of a municipality are the collection and disposal of garbage, miscellaneous waste and ashes, and the cleaning of its streets and alleys. These operations vitally affect the health, safety and comfort of its citizens and, if properly performed, promote their prosperity and welfare. Therefore, the organization to perform these duties, its methods and equipment, and the disposal plants and dumps, have been given careful consideration by the present administration.

The magnitude of this work and its various difficulties will be grasped more readily if our city's size and the mileage of its streets and alleys are borne in mind. Chicago has an area of approximately 200 square miles. Its average length is 20 miles, and its average width is 10 miles. It has 3,676 miles of streets, 523 of which are not paved. It has 1,938 miles of alleys, 913 of which are not paved. The length of streets and alleys combined is 5,615 miles. In mileage, both of streets and alleys, Chicago far exceeds any other city in the United States.

The cleaning and maintenance of Chicago's streets and alleys, removal of its household refuse, and kindred duties, are performed by the Division of Street Cleaning and Waste Removal.

In street cleaning, the so-called "block" or "patrol" system is employed. That is, a laborer is employed continuously in a defined territory within which he is able to keep the street practically free from litter at all times. Such street cleaners are the so-called "white wings." Their uniforms of white duck make the wearers conspicuous and serve the double purpose of keeping the street cleaner on his job and of protecting him from injury. Drivers generally exercise caution upon approaching and passing these men.

Power Flushing

The patrol system is supplemented by operation of power flushing machines. Where streets are much traveled, moist filth quickly smears and firmly adheres to the surface of the pavement. Neither broom nor scraper will remove this dirt from a dry street. Traffic quickly pulverizes it into disagreeable dust when pavements are dry, or into muddy paste when wet. Washing with water driven by force is the best method of cleaning such streets.

Power flushers were first used in the city of Chicago, supplanting horse-drawn machines, during 1912. A flusher averages about 20 lineal miles per shift of 8 hours, and washes the full width of the street in a single operation. Flushing is confined to summer months. The city owns twenty-eight power flushers.

Power Sweepers

The city has a limited number of power sweepers, used in the outlying wards, where they are least liable to be handicapped by parked automobiles. They operate at a speed of 6 miles per hour, and cover a width of about 7 feet.

Auto Traffic and Street Cleaning

As automobile traffic increases, street cleaning in like ratio becomes more difficult. Seventy-five per cent of street dirt on the pavement finds its way to the gutters within a few hours, and with the sides of the streets lined with parked cars, there is limited opportunity to remove it. This makes street cleaning and snow removal slower and more costly now than formerly.

The growth of the city, the extensive building operations, the great increase of population in the outlying sections, and the increasing and reasonable demand for more frequent cleaning and removal of refuse from alleys to prevent destruction of tires and aid in accessibility to garages built on rear of lots, have made expansion of street-cleaning and waste-removal service imperative, and added to the burden of expense.

Weed Cutting—Snow Removal

One of the many activities of the Cleaning Division is the cutting of weeds along streets in the outlying parts of the city. This contributes to the safety of pedestrians and motorists, reduces fire hazards, and is a much-appreciated service. The work is now performed by horse-drawn equipment, enabling the operator to cover considerable distance in a comparatively short time.

The opening of highways immediately following and frequently during progress of snowstorms is a most important duty of the Bureau of Streets.

Street Cleaning

1,386,867,643 square yards of streets were cleaned (block and gang system).
1,684,531 inlets were cleaned.

Cost of labor	$1,149,422.87
Cost per 1,000 square yards	.828
Cost per capita	.295

Alley Cleaning

58,208,543 square yards of alleys were cleaned.

Cost of labor	$47,799.00
Cost per 1,000 square yards	.82

Weed Cutting

2,729,298 square yards of weeds were cut.

Cost of labor and teams	$4,851.50
Cost per 1,000 square yards	1.777

Snow Cleaning

First Ward (downtown district)

7,311,500 square yards of streets were cleaned of snow.
40,939 cubic yards, or 7,084 loads, of snow were removed.
217 cubic yards, or 39 loads, of cinders or salt were spread on icy pavements.

Cost of labor and hauling	$15,083.77
Cost per cubic yard hauling snow, cinders	1.095
Cost per 1,000 cubic yards	6.166

Other 49 Wards

76,598,534 square yards of streets were cleaned of snow.
386,768 inlets were cleaned.
35,498 cubic yards, or 6,039 loads, of snow were removed.
9,904 cubic yards, or 1,898 loads, of cinders or salt were spread on pavements.

Cost of labor and hauling	$203,693.13
Cost per cubic yard hauling snow, cinders	4.486
Cost per 1,000 square yards	2.659

Emergency Repairs

7,609 cubic yards of cinders were hauled for filling.
36 cubic yards of crushed stone used.
Barricades set up and removed, dead trees removed, etc.

Cost of labor and hauling	$7,750.36

Traction Cleaning

503,796 miles of street-car right-of-way were cleaned.

Charge for cleaning—$60.00 per mile.	
Revenue derived	$362,733.54

Snow-plows were first used in Chicago during 1912, and since the rapid increase in number of motor-driven vehicles, as soon as snow averages a depth of 1½ to 2 inches the Bureau mobilizes its chauffeurs and helpers and puts in operation its 25 motor power plows. These operate in batteries of two, and are used in the Loop and on important thoroughfares throughout the city. Their operations continue in shifts of eight hours each day, continuously, day and night, as long as conditions require, opening up channels to traffic for the benefit of business and those dependent on automobiles for travel. When necessary, snow is removed from the Loop and downtown district, and so far as possible from business streets throughout the city, also from prominent street-car intersections.

Where conditions are favorable, mechanical snow loaders are employed. Their use markedly minimizes the cost of removal. This division now has four of these machines and, when operating where the snow is well banked, each is capable of loading a truck in about one minute. The city owns nine snow loaders.

During the winter, snow is removed from the Loop promptly, and the snow-plow service, cleaning of intersections, cleaning of crosswalks and opening of gutters and inlets throughout the city is very satisfactory.

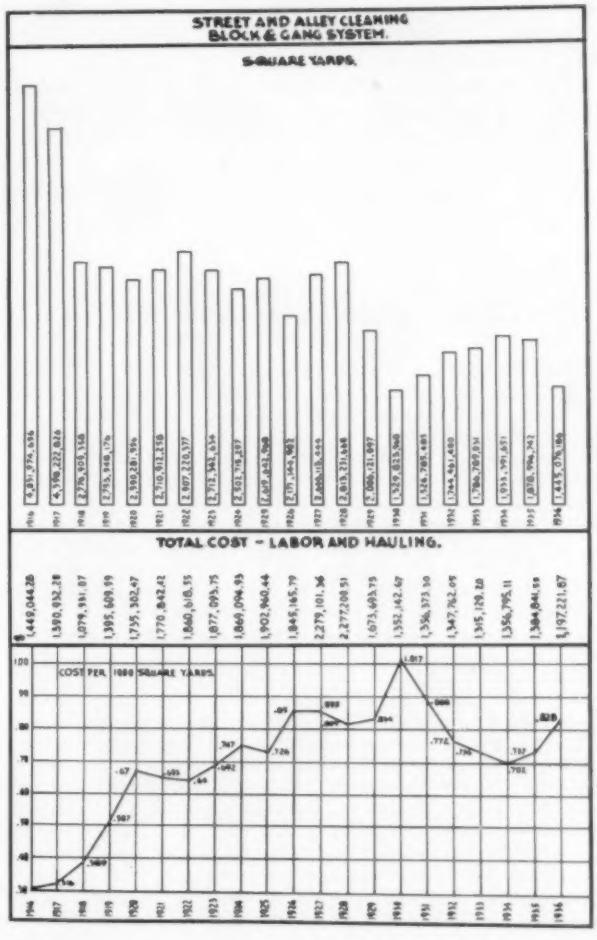
Maintenance and Repair of Automotive Equipment

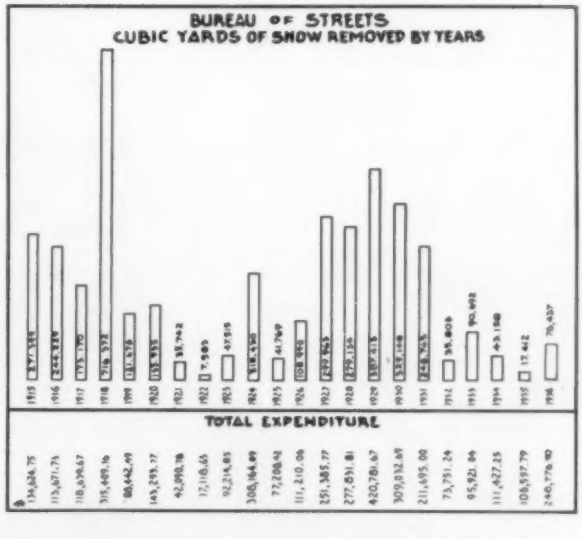
The office, main garage and shop for the care of motor equipment and trailers, is located at 2322 South Ashland Avenue, in a building remodeled for the purpose during 1912. Since that time, another garage has been built, giving one on each side of the city. The Bureau's types of equipment, with the exception of trailers, are housed in these garages. Trailers are housed in the wards near the work.

All major repairs and replacements are taken care of at the main garage and shop.

In its street-cleaning and waste-removal activities, the city has at present 525 trailers of 6-yard capacity em-

STREET CLEANING COSTS





ployed in collection of garbage, street dirt, refuse and ashes, and 88 5-ton tractor trucks, 62 hired trucks and 70 city-owned trucks, used in hauling the trailers to dumps and loading stations.

Frequent and thorough inspection and prompt repair of trucks and trailers result in reliable service. The work of repairing and maintaining the city's equipment is well and economically performed; the cost compares very favorably with that of other corporations and cities throughout the United States.

The city's normal cleaning force averages, daily, about 900 men and 77 foremen. This great cleaning army leaves the various ward yards each morning to engage in daily battle against dirt. To make the work of this large cleaning force effective, the citizens of Chicago, too, have a responsibility in the work. No matter how up-to-date the equipment, how modern the methods or how efficient the organization, a standard of cleanliness for streets and alleys cannot be maintained unless there is continuous and earnest cooperation on the part of the public.

International Housing and Town Planning Merger

BY action taken at the end of the joint congress held in Paris July 3-10, a merger is to be effected of the International Federation for Housing and Town Planning and the International Housing Association. It is contemplated that the consolidation will become effective about the first of January, 1938. The office will be in either Switzerland, Holland or Belgium, most probably, however, in Brussels. George L. Pepler, of London, was continued as the provisional president of the new group, which has adopted the name of International Federation for Housing and Town Planning, until after the next congress, which will be held in Mexico City late in the summer of 1938. Thereafter Dr. Strölin, Mayor of Stuttgart, Germany, becomes president. The 1939 congress is scheduled for Stockholm.

The two organizations named twelve members each of the executive committee in the new Federation. No American was named by the International Federation for Housing and Town Planning, the reason given being that it was hoped to have as directors, persons who could attend meetings. The International Housing Association, however, named Alfred Bettman of Cincinnati as one of its representatives on the executive committee. It is contemplated that Donald C. L. Murray of the London group and Miss Paula Schäfer of the Frankfort group will continue in the new secretariat.

Among the Americans present at the congress were Mayor and Mrs. Daniel W. Hoan of Milwaukee; Coleman Woodbury, National Association of Housing Officials; Clifford W. Ham, American Municipal Association; Walter H. Blucher, American Society of Planning Officials; Mr. and Mrs. Guy Moffett, Spelman Fund; Miss Helen Alfred, National Public Housing Conference; Carl Feiss, Columbia University; Mr. and Mrs. Carlos Contreras of Mexico City; Mr. and Mrs. J. Hebrar, University of Michigan; Mr. and Mrs. Henry W. Toll, Council of State Governments; Rowland Eggar, University of Virginia; Walter E. Bognes, Harvard University; Mr. and Mrs. Walter E. Trevett; George H. Gray, New Haven, Conn.; Alfred K. Stern, Illinois Housing Commission; Raymond V. Parsons; Mrs. John Hope; Dr. Sara Stetes; Mrs. Herbert Mitler; Erwin Adelberger, Kenneth Smith and W. Howard Hopkin of PWA; Neil Connor, architect; and George B. Zug, formerly of Dartmouth College.

Three principal subjects were discussed: Financing of Cheap Housing, Vertical and Horizontal Building, and Regional and National Planning. It was generally agreed that horizontal housing is desirable, though a few speakers urged that under certain conditions of high land value vertical building might be necessary in slum areas. Sir Raymond Unwin again called attention to the fact that with a coverage of 10 families to the acre, the entire population of the world might be housed in the state of Kansas.

Interesting reports were submitted on national planning, but since they were limited to "physical" planning it was difficult to make comparisons with the regional and national planning now going on in the United States.

The delegates were much surprised when taken to the "garden cities" of the Paris region to find rows of apartments with very little play space. They did find buildings sometimes of what we might call lavish construction, renting for $4.00 *per apartment* per month, because no attempt is made to recoup the capital investment or get a high rate of interest.

WALTER H. BLUCHER.

At Last–A New Building Code for New York

A NEW Building Code for the city of New York, which since 1932 has been held in committee by the Board of Aldermen, was approved by that body on July 20, to become effective January 1, 1938. It will replace the 21-year-old code now in force.

The main features of the new code were drafted by a special committee of the Merchants' Association of New York. Enactment of the measure has repeatedly been urged by important business, architectural and civic groups. Among these was the New York Building Congress, whose President, Thomas S. Holden, describes the code as "a marked contribution to the public welfare as well as to the building and real estate interests."

Final and favorable action on the code was undoubtedly stimulated by a recent letter written to Chairman Edward J. Sullivan of the Committee on Building of the Board of Aldermen, on behalf of The City Club of New York by its President, Richard S. Childs. In this letter and in the newspaper publicity which resulted from it, a humorous drubbing was administered to the mysterious forces which were preventing a vote on this modernization of New York's building code. In reply to a previous letter from The City Club, Alderman Sullivan had stated: "I have tried every means to induce the proper people, in order to attain this end, but, up to now, have met with no success," and added that "it would be a crime to keep this valuable document away from the building industry any longer."

In his reply to this letter Mr. Childs expressed appreciation for the Aldermen's "candor" and urged the Board of Aldermen to

"take a long breath and pass the code anyway. Just as if you were grown men! Just as if the capitol of the city were located at the City Hall! Just as if you were paid $5,000 a year for taking such responsibilities! Just as if you had minds! Just as if you had guts! For as long as you do not shake yourselves free, we, the citizens, are not free either, but are victims of an invisible government with unknown motives of its own."

The new code is a comprehensive document, covering such subjects are: Administration, Building Line Projections, Fire Resistance, Fire Protected Construction, Fire Limits, Slum Prevention, Ventilation, Required Exits, Stairways, Smoke Hazard, Fireproof Wood Doors, Show Windows, Materials and Stresses, Live Load Requirements, Wind Pressure, Unit Stresses, Reinforced Concrete, Lumber Stresses, Foundations, Welding, Pile Foundations, Masonry, Modern Concrete Construction, Wood Frame, Building Precautions, Rating Materials, Roofing Tests, Fire Resistive Doors, Interior Trim, Smoke Nuisance, Fire Insurance Rating, Theaters, Elevators, Plumbing and Gas Piping, Roof Leaders, Sprinkler Systems, and Standpipe Systems.

Glass Covers for Sewage Works—Design and Maintenance

By WALTER KELSEY
Lord and Burnham, Irvington, N. Y.

CONSIDERING that there are over 500 glass covers used at sewage-treatment plants in the United States as enclosures for sludge beds, sprinkling filters, rotary distributors, settling and skimming tanks, and that the trend toward glass covers is apparently increasing, it is unfortunate that so little is known about their maintenance. This is probably accounted for by the fact that most glass covers have been built by one or two firms which have developed crews of highly specialized mechanics, which has reduced maintenance requirements to a minimum. The use of PWA and WPA labor in recent years has somewhat changed this picture.

Replacing Glass

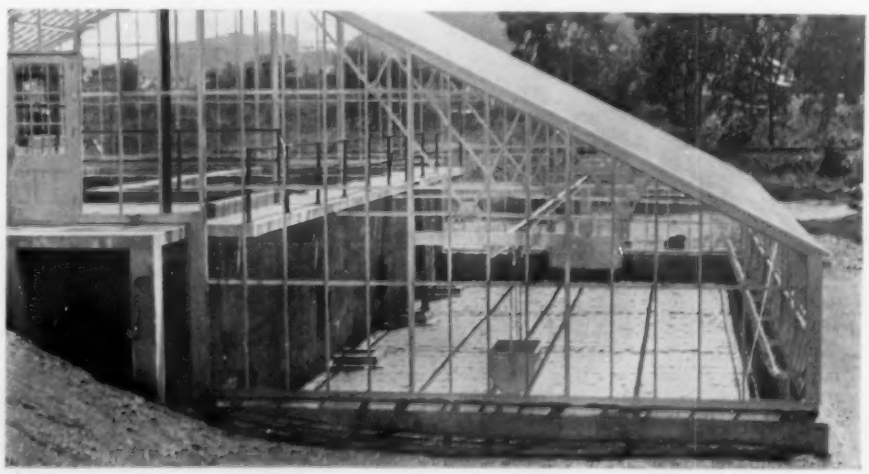
The item of maintenance which the plant operator will most frequently encounter is the replacing of a broken light of glass and the repainting of the framework. If the structure has been properly designed in the first place and properly glazed by competent mechanics, broken glass should not be a large item. For instance, on one particular job containing 8,000 square feet of glass, there has not been a broken light of glass in the past eighteen months. The operator is not so fortunate in other cases, for small boys throwing stones may cause this item to increase greatly. In a properly designed structure, 80 per cent or more of the glass will be found to be of one stock size and will fit just as it comes from the box without cutting. This glass is usually 16 by 24 inches and is known as "double-strength B quality."

In replacing a light of glass, all old putty and glazing points should be removed from the bar, and the bar should be given one coat of paint and allowed to dry. A generous bed of putty should then be placed in the putty groove. In placing the light of glass, care should be taken to see that it is bedded evenly. Start at the top, using both hands flat on the glass, and work it in so that the putty shows a uniform bed on the under-side. The glass is usually held in place by four wedge-shaped zinc glazing nails similar in appearance to the nails used by a cobbler for repairing shoes, and not with the triangular glazing points or staples such as are used in wood sash. Hold the nails flat on the light, and drive with a chisel or some similar tool which may be placed tight against the glass. Do not drive the nails in diagonally, and do not bear down unduly on the glass when driving the nails. The object is to get the light in place without an uneven strain, which invariably causes cracking of the light at a later date.

Having secured the light in place, all putty should be cut flush with the glass. No back putty should be used on the outside, as is the practice in glazing sash, since the snow and ice slide down the roof and quickly dislodge this back putty and loosen the glass. After the excess putty has been removed, the bar should be painted again. The most important thing is to be sure that the putty bed is thoroughly covered with a coat of paint. In order to be certain, it is well to carry the paint out about $\frac{1}{8}$-inch on the glass. It is more important to see that the putty bed is properly covered with paint than it is to paint the wood bar, which will probably be of cypress and would stand up for a great many years even if left unpainted, although it would not look particularly well.

Painting

To insure lasting and satisfactory glass covers, they should be painted every three or four years, although this will vary, depending upon location. If the steel work is



IMHOFF TANKS AND SLUDGE BEDS OF THE WEST HAVERSTRAW, N. Y., SEWAGE-TREATMENT PLANT, COMPLETELY ENCLOSED

Note the low concrete foundation walls, mechanically operated ventilators opening inward, and the absence of gutters at the edge of the sloping roof

not hot-galvanized, it should be gone over with a wire brush and all rust spots removed, and it should be given a coat of red lead or some similar preservative paint.

Much time and effort have been given to experimenting with paint to be used on glass enclosures, and the best success to date has been secured with a paint composed of an aluminum powder and a varnish vehicle.

In a repainting job the most important thing is to be sure that the steel is completely covered and that the putty bed inside and out has been properly striped.

A Word About Design

For the benefit of the plant operator who may be called upon to place a glass cover over his existing plant, and where a consulting engineer is not available and the design is left to the plant operator's discretion, a word on general design is not out of place.

The height of the concrete walls above the sand level should not be less than 12 inches nor more than 24 inches. Most walls at the present time are designed to be from 16 to 18 inches high. If the walls are too low, the depth of dosing is limited. If the walls are too high, the sludge within their shadow line does not dry readily. At the same time, the walls must not be too low relative to the outside grade. If they are, snow banking against the glass side during the winter will melt in the daytime owing to the higher inside temperature and conductivity of the glass, allowing water to seep between the walls and sills and between the side sash and sill. This water will freeze during the night when the temperature drops, and will push the members out of line, breaking the glass.

The lower line of side ventilating sash should be arranged to open in, and the roof or ridge sash should be arranged to open out. The controls for the sash should be of the rack and pinion type with enclosed gears and provisions for packing the gears with lubricant. The control points should be easily accessible on the outside of the house, or at least adjacent to the doors. As far as possible, all control points should be grouped together at one end of the building. It is not necessary that the upper line of side sash be made to open nor to furnish gable ventilation. Undoubtedly such arrangements are desirable in some cases, but whether the additional cost is justifiable in standard practice is debatable.

The gears operating the ventilating apparatus should preferably be placed on the line shaft. After the plant is in operation, the gear boxes should be repacked with grease at least once a year, and the racks should be greased every two or three months.

Exterior gutters, other than middle gutters between two gables, really have no place on a glass cover. They restrict the snow from sliding off the roof, and cause it to back up along the last light of glass. The snow melts, water gets between the glass laps, and freezing will break the glass. Plant operators having existing glass covers with outside gutters that prove too troublesome can usually burn them off with a gas torch, and attach a molding along the face without unduly marring the appearance of the structure.

Occasionally it is necessary to build glass covers of ridge and furrow construction, with center gutters. If the plant operator has a cover of this design, he should keep the gutters as free of snow as possible by shoveling it out immediately after each storm.

If funds permit, have all steel work hot-galvanized after fabrication. This will more than save the extra cost during the first ten years of maintenance. In fact, glass covers that are used over sprinkling filters or rotary distributors should never be built without all of the steel being hot-galvanized for protection against rust.

Valuable Advice for Elected Officials

THE Division of Sanitary Engineering, Illinois Department of Public Health, recently addressed a statement "To the New City Officials," which deals with the tenure of office of men operating a sewage-treatment plant. We quote this statement and heartily endorse it:

"As you assume your new duties in public service, may we respectfully offer these comments for your careful consideration?

"Too often, a change in administration means that many employees of the municipality are changed as a matter of course, regardless of the manner in which they have served. When an untrained man is made responsible for the operation of the sewage-treatment works, at least a year will pass before he has a reasonable understanding of the plant, knows how to do and interpret the laboratory work and can meet emergencies satisfactorily. In the meantime, there is loss of efficiency and economy as well as danger of complaint and ill-feeling by residents near the plant and bordering the outlet stream.

"May we suggest that you carefully investigate the work of the incumbent operator before you consider his replacement? If he is conscientious, efficient, eager to learn more about his plant, and interested beyond his salary check, he is basically worth keeping. If the taxpayer's investment has been protected by good maintenance of structures and equipment, if the outlet stream has been above reproach (do not blame the operator for deficiencies in the plant itself, however), and if the plant site is neat and clean, then the operator is entitled to your encouragement and praise—not the loss of his job.

"Sewage-treatment plant operation is no picnic. The man who has struggled through four years or more of it has increased his value to the municipality, and deserves some consideration.

"'For the good of your town, we would recommend that you think twice before making a change."

Care of Distribution on a Sprinkling Filter

IN general, the operator's duties in connection with trickling filter operation resolve into: (1) maintenance of distribution facilities so that the sewage is dosed uniformly on all parts of the bed; (2) controlling growths on the filter media so that surface clogging does not occur, resulting in "pooling" or "ponding"; and (3) keeping underdrains clean and clear so that good drainage and ventilation result.

A few hints on the care of distribution facilities are given in a recent issue of *The Digester*, and we list them for your information:

1. Keeping the dosing tank clean and clear of obstructions.

2. Accumulations of slime on the dosing tank walls may be controlled by hosing once or twice a week. If excessive accumulations are present, take care in removing them so that the slime will not be carried into the distribution system or filter and clog them.

3. Nozzles or revolving distributor orifices must be kept clean. If a stiff bristle brush is used for this purpose, grease and slime will be removed as well as matches, pieces of scum and other foreign objects.

4. Passage of the settled sewage through a ½-inch mesh screen will remove much of the material which clogs nozzles and orifices and will therefore reduce work. The mesh screen should be removable to facilitate cleaning.

5. Keep the revolving distributor arms adjusted so that the outer ends get a proper share of the flow.

Effective Control by Parking Meters

By LEON R. BROWN
Safety Engineer, New York State Railways, Rochester, N. Y.;
Chairman of the Traffic Committee of the Rochester Engineering Society

METERS should be given consideration as a means of regulating parking. I was very fortunate this spring in being able to visit many of the cities where such meters are used. This visit was for the sole purpose of learning about the meters. I have examined the various makes of meters, seen them in operation, talked with the various city and police officials, automobile-club executives, chamber of commerce officials, merchants, shoppers, and parking-station owners. I have hundreds of pages of data on the subject and will give a summary of the facts I learned.

There are now about 20,000 meters in use in 35 cities of the United States. The parking meter is a clock device mounted on a post about 4 feet high, about a foot back from the curb; and when set in motion by depositing a coin, it measures the elapsed time. When the allowed parking time has expired, a distinct signal appears. The meters are spaced along the curb about 20 feet apart, and stalls for parked cars are painted on the pavement opposite each meter.

A driver wishing to park drives into an empty space and drops a nickel in the slot of the meter. This starts the meter operating from zero. A sign on the meter gives instructions and parking regulations, and shows the time allowed before the expiration signal will show. If there is unelapsed time remaining on the meter from the last parker, a driver may use this free if he leaves the space or deposits a nickel before the time expires. In most cities a parker may stay in a space as long as he wishes if he deposits a nickel before the end of each parking period. Some types of meters have a lever which must be turned to set the meter at zero and start it after depositing the coin.

One of the important benefits of metered parking is the spacing of parked cars 20 or 22 feet apart. This permits ease of access and egress, thus saving time and avoiding congestion. It is said the motorist's saving on prevention of bent fenders and bumpers more than offsets the small charge. Because of this spacing, there is room for about 20 per cent fewer cars than before, but it has been found that about three times as many cars park in them.

In cities where it is used, the meter seems to have completely eliminated double parking. This is because the all-day parker and those who do not care to spend a nickel have gone elsewhere, leaving plenty of parking spaces, so that one can find an empty space almost any time, anywhere. This fact and the time saved in getting into and out of parking spaces have caused traffic to be speeded up as much as 15 per cent.

Loading Zones and Taxi Stands

Rules regarding deliveries and pick-ups vary in different cities. They may be made to fit conditions. Loading zones may be provided, or trucks may use the metered spaces free for short periods. In some cities the trucks pay after 10 A.M. This encourages early-morning deliveries.

Taxi stands are usually assigned free spaces, as before meters are installed, but it is possible, as in Oklahoma City, to permit taxicab companies to rent the spaces for a price per day equal to what the meters would produce at that location.

It is my belief from personal contact in the cities where parking meters are installed, that at least 90 per cent of the persons of the various groups involved like them. Merchants and shoppers both are in favor of them. When one side of the street has them, merchants on the other

LOADING-ZONE ON A METERED STREET

side demand them. When one town has them, the merchants of nearby towns demand them, showing that they draw out-of-town shoppers rather than driving them away.

Enforcement Assured

The parking meter, in places where I saw it, brings 100 per cent enforcement, impossible by any other means. Funds derived from the meter are ample to hire the needed police. One officer on a motorcycle can obtain complete enforcement from 500 meters. He is "on the spot," so to speak, because the over-parked car discloses a signal easily seen by all passers-by. An officer can no longer favor his friends. The meter-reading itself is proof enough for anybody, and there are few arguments. In all the metered cities visited, I could find no over-parked cars unless they had already been tagged by the officer. In the eleven annual parking surveys we have made in Rochester, where there were no meters, over 50 per cent of all cars have overstayed their time limits, and I believe this same ratio obtains in every city in the state, because time-limit parking without meters cannot be enforced 100 per cent.

Revenue

While the revenue from meters is incidental, it is at the same time substantial. Each meter produces an average of about 40 cents a day. This falls into a sealed container in the meter and may be collected daily by a representative of the City Auditor's office. The yearly collections from 1,000 meters at this rate amount to $120,000. This money can be used for more traffic police, cars, motorcycles, and traffic signals.

Meters, like everything else, are subject to objections and abuses. The following cautions should be observed when purchasing meters:

1. Select a meter which is simple to operate and difficult to beat, one that will stand the climate and have low maintenance.
2. Do not install too many meters, nor in locations where they are not needed to regulate parking.
3. Do not install meters in locations where "No PARKING" is required to avoid congestion.

Objections Overruled

Opposition to meters has come principally from the automobile associations, but I found that where meters are used, the Auto Clubs have withdrawn their objections after a short trial. A New York State association recently published objections stating that meters were additional taxes on autoists, that damage claims would result, and that meters did not relieve congestion. But I have found that when parking is allowed on a street, there is less traffic congestion with meters than without them. I also found that the meters had created no serious liability problem. As to the additional tax, I believe the small parking fee is more than offset by the saving in bent fenders and in gasoline ordinarily used in searching for a parking space. If the fee is considered an additional tax, it is a fair one, for why should not the motorist pay something for the use of city streets? At present in cities he pays nothing toward the maintenance of traffic courts, traffic signals, or traffic officers; nor does he pay for pavement costs or repairs or for bond interest on such costs. In cities, all such expenses come from real estate taxes, and real estate should be relieved of this expense.

I believe the solution of the parking problem is nearer than ever before.

—From a paper presented at the New York State Conference of Mayors and Other Municipal Officials, June 29, 1937.

Taxes Reduced to $1.90 by Electric Plant

VERNON, TEXAS, has a bonded indebtedness of approximately $600,000, which is less than 10 per cent of the total normal taxable values. The tax rate is $1.90, including school taxes. No default of principal or interest has ever occurred, and no extensions of time limits were ever necessary. During the past year $156,960 of bonded indebtedness was refunded at a lower interest rate—a decrease from 5½ per cent to 4½ per cent was secured. After transferring to the interest and sinking funds sufficient sums to meet 1937 interest and principal payments, a cash balance of $30,000 remains. Taxable values have been reduced from $8,250,000 in 1929 to $5,200,000 in 1936, and the tax rate has been reduced from $2.15 to $1.90 over the same period.

All reductions in valuations and tax rates have come about through earnings of Vernon's municipal light plant. Built in 1923 with a total capacity of 300 hp at an initial cost of $45,000, the plant has been enlarged until its capacity is nine times that of the original—2,700 hp. It now represents an actual investment of more than $450,000 and is debt free. The entire cost has been paid out of the net earnings of the plant with the exception of the initial construction costs of $45,000.

During the last five years, revenues from the plant have almost doubled. In 1931, $34,541 was collected. This amount increased to $44,863 in 1932, and to $54,161 in 1933. In 1934 over $5,000 more was collected; still an additional $8,000 was collected in 1935, until in 1936, $72,896 was taken in by the city as light revenues.

The fact that the plant operates in competition with a private company has not deterred its progress, for approximately 65 per cent of the consumers in Vernon patronize their own plant.

It is estimated that the plant has saved the citizens of Vernon more than a million dollars since its beginning because of the lower rates which were made possible.

There is one rate for all purposes. For the first 30 kw a charge of 8 cents per kw is made. All over 30 kw is charged at the rate of 3 cents, and a sliding scale is provided for large consumers.

There is no question as to the popularity of the plant; the people who are its patrons are loudest in its praise, and even those who for some reason or other have not seen fit to give it their support, recognize the fact that they are getting a direct reduction in rates because of its operation. The municipal plant in Vernon has proved to be the best investment the city could ever make in the interest of its citizens and taxpayers.

—From *Texas Municipalities*, May, 1937.

THE POLICE AND STRIKES

"Many times our duty may be unpleasant, difficult and unpopular, but we have got to do it. Law and order must be maintained. Regardless of one's views, when force is used to exact any demand improperly or illegally, a superior force must be used to suppress it.

"On the other hand, the Police Department belongs to all of the people and not to any one group. The policeman's nightstick must not be used to settle economic issues between groups."

—From an address by Mayor Fiorello H. La Guardia of New York before the International Association of Chiefs of Police July 27, 1937.

Water for Industrial Purposes

Part II

The Requirements of Different Industries Vary Greatly

By W. D. COLLINS
United Geological Survey

Water for Brewing

Comparatively few natural waters are satisfactory for use in a brewery without treatment.[5] Because 85 to 95 per cent of the finished product is the water used in the brewing, it is obvious that the water should be free from odor and taste. It is generally desired to have the water free from suspended matter, and it is almost necessary that the content of iron be vanishingly small. Many waters are aerated to oxidize the iron and assist in the removal of odors. Filtration removes the suspended matter and the precipitated iron. Frequently the use of a coagulant is necessary for satisfactory clarification by a filter. Treatment with activated carbon is effective in removing odors.

Lime, calcium chloride, or an acid may be used to reduce the alkalinity to a desirable point. For the best results the alkalinity must be low.

Calcium sulphate must be added to most natural waters to produce the best results. One writer suggests that a total hardness of 200 to 300 parts per million is generally most advantageous. Sodium chloride is often added in small amounts.

During the period when home brewing was widely practiced, the operators of water-works filtration plants who had to maintain a pH of 9.0 or more in the finished water to avoid corrosion of mains and service lines received many complaints because a water with so high a pH was found definitely unsatisfactory by the home brewers who needed water with pH below 7.0.

The water used for mashing in a brewery is not suitable for use in cleaning bottles and equipment nor for boiler feed water.

Water for Canneries

The effect of hard water on the canning of vegetables appears to be confined practically to the hardening of peas when they are packed with water of hardness of between 200 and 400 parts per million.[6] The hardening has been associated with the absorption by the peas of the calcium in the water. The belief that the market value of peas packed with hard water is lowered is so general that many plants have installed softeners to treat water for canning peas. Recent work[7] has shown that peas allowed to stand in contact with the juice of the vines may absorb large amounts of calcium which will cause hardening of the peas. At times the salt used in canning contains enough calcium to render the brine hard enough to affect the peas.

Water for Carbonated Beverages

Obviously, water for carbonated beverages must be safe to drink and also should carry no suspended matter which will settle out in the bottle. Any dissolved iron in the water will usually precipitate on standing. Sometimes a precipitate will appear in the bottle when the water has been treated and the separation of insoluble matter had not been completed at the time of bottling.

A recent study[8] throws some light on the effect of alkalinity on the keeping quality of carbonated beverages. In one of a series of experiments, a fruit-juice beverage was prepared with waters of different alkalinities, using the same amount of prepared syrup for each sample, and the bottles were innoculated with wild yeast to the extent of 164 cells per cc. After standing ten days, a sample made with distilled water had a count of 2 yeast cells per cc, and one made with water of alkalinity about equal to that of the Dayton, Ohio, public supply had a count of 91,000. Over a period of three years the author found that spoilage was entirely eliminated where the alkalinity of the water was reduced to below 100 parts per million. Hydrated lime was used to remove calcium or magnesium alkalinity, and calcium chloride to remove alkalinity caused by sodium bicarbonate.

Water for Confectioneries

In an article on the effects of water quality on candy quality[9] it is noted that the candy distributed in the United States in one year carried about 40,000 pounds of rock materials that were in solution in the water used in manufacture. No one was injured or cheated by this tonnage of rock, because it was distributed, unevenly of course, in a good many pounds of candy. The manufacturers who put some of this rock material into candy did suffer from it. Also some of those who sold sugar and other materials to the manufacturers.

An instance is mentioned of a candy maker who sought everywhere, but in the water, for the cause of an off-color in fondant. Finally, after all the other ingredients were found to be blameless, the consulting laboratory found that iron in the water was the cause of the objectionable color. Removal of the iron cleared up the trouble.

[5] Lammers, F. J.: "Water Purification in the Modern Brewery and Distillery."—*Ind. and Eng. Chemistry*, vol. 26, pp. 1133-1138, 1934.

[6] Bigelow, W. D., and Stevenson, A. E.: "The Effect of Hard Water in Canning Vegetables."—National Canners Association Research Laboratory Bull. 20-L, 39 pp., 1923.

[7] National Canners Association Research Laboratories: *The Canner*, vol. 82, No. 11, Part II, p. 110, Feb. 22, 1936.

[8] Buttler, H.: "Alkalinity Control of Ingredient Water."—*Food Industries*, vol. 8, pp. 233-234, 1936.

[9] Jordan, Stroud: "Minerals in Water Cause Variations in Product Quality."—*Food Industries*, vol. 4, pp. 89-91, 1932.

An investigation made in 1930 at the request of the National Confectioners' Association showed widely different effects on the character of hard candy and of fondant when identical materials and processes were used with twelve different waters that resembled natural waters in use in different parts of the United States. The results of the study did not furnish definite limits for the composition of water suitable for the manufacture of confectionery, but they indicated that natural waters with less than about 50 or possibly 100 parts per million of the usual dissolved mineral constituents would generally be satisfactory. Distilled water can be used for making fondant where inversion of sucrose is necessary, but ordinary distilled water is not satisfactory for hard candies, because it is likely to have a pH of from 6.5 to 6.1, which favors inversion and makes the candy sticky. This difficulty can be corrected by passing the distilled water through a bed of calcium carbonate, which may raise the pH to as much as 7.4. Variation in water quality may be corrected by the addition of the right quantities of the proper chemicals, but each water is a problem by itself for each type of candy.

Water for Ice Manufacture

In the early days of the manufacture of artificial ice the regular practice was to use distilled water, but with improvements in methods it became the more common practice to freeze natural water either without treatment or after such treatment as was necessary to produce ice that could be marketed.[10] Many investigations have been made of the causes of various defects in ice made from natural water and of methods for treating water for the purpose of decreasing or eliminating the defects.

To some extent improvement in the quality of ice may be obtained by variations in the freezing process. Altering the brine temperature to change the rate of freezing, changing the amount of air agitation, and varying the practice as to withdrawal of core water may improve the quality, especially as to white cores, white deposits, and shattering. Colored cores or deposits that result from the presence of dissolved iron or natural coloring matter are not generally prevented except by chemical treatment of the water. Because the carbonates seem to be more detrimental than sulphates, it is sometimes possible to correct a clear water that has only a moderate content of carbonate or bicarbonate by the addition of aluminum sulphate or even sulphuric acid to convert the carbonates to sulphates. If the water contains so much calcium and magnesium bicarbonate that neutralization is not enough, it is possible to remove a large percentage of the calcium and magnesium by the use of hydrated lime followed by sedimentation or filtration. The lime treatment also removes iron and much of the suspended matter.

In general, the soluble sulphates and chlorides of calcium, magnesium, and sodium and also sodium carbonate cause about the same kinds of defects, but it has been commonly considered that the chlorides are about one-fourth less objectionable than the sulphates, and the sodium carbonate one-fourth more objectionable. Water may be classified on the basis of its total content of soluble salts expressed as equivalent sulphates. A widely quoted classification states that from water in which the total quantity of equivalent sulphates is less than 171 parts per million (10 grains per U. S. gallon) first-quality ice can be expected with efficient air agitation and average brine temperatures. As the total equivalent sulphate content increases, the air agitation must be increased and the brine temperature raised. Between 342 and 684 parts per million, the manufacture of acceptable ice may be doubtful, and above 684 parts per million merchantable ice cannot be expected.

A treatment for water containing several hundred parts per million of sodium carbonate or bicarbonate was worked out several years ago at the University of Illinois.[11] It involved passing the water through a bed of a zeolite which contained replaceable magnesium. The sodium of the water was exchanged for magnesium, which was then largely removed by precipitation by lime, thus materially reducing the quantity of dissolved solids in the water. The exchange silicate was regenerated by a solution of magnesium chloride. A more recent process[12] uses a carbonaceous exchange zeolite which gives up hydrogen in the zeolite for either calcium, magnesium, or even sodium in the water, thus transforming carbonates of these ions into carbonic acid. This zeolite is regenerated with dilute sulphuric, hydrochloric, or other acid. The studies at the University of Illinois also developed details of operation[13] that raised the allowable limit of salt concentration in raw water from 256 parts per million to 1,300 parts per million. The changes in operating practice involved some additional cost over the practices that can be used with waters of low mineral content.

Water for Laundering

Laundering, both in the home and in commercial laundries, has long been recognized as a use of water that is greatly affected by its chemical character. The excessive consumption of soap and the inferior quality of the finished work caused by hard water are well known. When the only regular method of water softening was by the use of lime and soda ash, a laundry using a naturally soft water like that of some of the large public supplies was much better off than one that used a softened hard water. The introduction of the zeolite softener reversed this condition, because the softener can furnish water that is softer than the best of the naturally soft waters. The recent introduction of a special phosphate[14] that prevents the separation of calcium soaps gives another method of overcoming the troubles resulting from hard water.

Any water treatment obviously adds to the cost of operation, although it may make a saving in total costs as compared with using hard water without treatment. Water

[10] Ehrenfeld, C. H., and Gibbs, R. E.: "Water for Ice-Making and Refrigeration."—Nickerson and Collins Co., 1928.

[11] Burks, Dana, Jr.: "Treatment of Water for Ice Manufacture."—Illinois Univ. Eng. Exper. Sta. Bull. 219, 1930.

[12] Applebaum, S. B., and Riley, Ray: "A New Method of Conditioning Water to Remove Sodium Bicarbonate Chemically Instead of by Distillation," presented before the Division of Water, Sewage, and Sanitation Chemistry at the 93rd Meeting of the Am. Chem. Soc., Chapel Hill, N. C., April 12 to 15, 1937.

[13] Burks, Dana, Jr.: "Treatment of Water for Ice Manufacture."—Illinois Univ. Eng. Exper. Sta. Bull. 253, 1933.

[14] Gilmore, B. H.: "Prevention of Calcium Deposits in Process Waters."—*Ind. and Eng. Chemistry*, vol. 29, pp. 584-590, 1937.

that needs no treatment or very little treatment is still an advantage.

Iron, maganese, and, more rarely, color and suspended matter, are detrimental in laundry work. They can of course be eliminated at a cost that depends on various conditions. Sometimes a water as pumped from the ground or delivered by a filter plant contains almost no iron but is sufficiently corrosive to dissolve from pipes enough iron to cause trouble in the laundry. The alkalinity of water used in rinsing affects the quantity of "sour" needed to prepare the washed goods for bluing. This has sometimes been recognized in the preparation of combined sour and blue mixtures by making the mixtures with different ratios of sour to blue for use in places where the rinsing water has high, low, or medium alkalinity.

Water for Paper Making

Paper making requires large quantities of water, but for the lower grades the requirements as to quality are not very rigid. Clear water is desirable.

In the manufacture of high-grade papers the quality of the product may be lowered by iron or color in the water. Hardness may interfere with proper sizing. It is possible to treat almost any water so that it will be acceptable for use in paper making, but the price of the product usually will not provide for extensive or complicated treatment of the water supply.

Water for Textile Plants

The water requirements of textile mills are so exacting that before the introduction of zeolite softening the most important factor in determining the location of a plant was generally the character of the available water supply.[15]

Scouring is the fundamental operation in the manufacture of woolen goods. The raw wool must be freed from all dirt and grease so that the fibers are uniformly clean and therefore ready to respond uniformly to subsequent treatment. Calcium and magnesium salts in the water used for scouring will unite with the soap to form the characteristic calcium and magnesium soaps which adhere so firmly to the bathtub in the familiar "ring." The wool fiber has, however, a much better surface than the bathtub for adhesion of the curds. These deposits make the wool fibers feel hard or harsh. They also make it impossible to do satisfactory dyeing. The dye cannot penetrate the fiber; the amount of dye deposited in the fiber yarn or piece of goods is not uniform in all parts of the material; uniform results are not obtained with different batches; the colors are less fast to rubbing, washing, storing, or exposure; and the cost for dyes and other needed supplies is increased because of the faulty scouring. The use of water containing calcium and magnesium in the preparation of the dye bath is a disadvantage. As an illustration of saving of materials, a typical report on the use for wool scouring of water softened from a hardness of about 70 parts per million to zero hardness shows a decrease in consumption of 1.02 pounds of soap and 0.31-pound of ammoniated potash per 100 pounds of wool scoured, or 44 and 25 per cent, respectively, of the amounts needed when unsoftened water was used. In the finishing of woolen piece goods, savings of 70 per cent of soap and 68 per cent of soda have been reported to follow the complete softening of water with hardness of from 70 to 85 parts per million.

In peroxide bleaching there will be precipitation of calcium carbonate and magnesium hydroxide in the bleaching bath and on the fibers if unsoftened water is used. Very small quantities of iron are oxidized in the peroxide bath, and cause a yellow tone or produce rust spots.

Calcium and magnesium in the water have as unfavorable effect in the degumming of silk as in the scouring of wool, resulting in an inferior product and waste of supplies as compared with use of water of zero hardness.

Dyeing of silk imposes the same requirement as wool dyeing with respect to freedom from calcium and magnesium. The common practice of adding to the dye bath a portion of the boil-off liquor resulting from the degumming furnishes an additional opportunity for damage to the fibers if hard water is used in the degumming.

When silk is weighted with tin salts, it is especially important that the fibers be in uniform condition throughout, with no deposited soap curds to cause uneven and spotty deposition of the tin, with consequent spotty dyeing. One report shows that complete softening of a slightly hard water reduced the dye consumption for 40 dozen silk hose from 63 ounces to 40 ounces. The match of color of the cotton upper and silk lower was much better and more lasting with the softened water.

The fact that rayon is a wholly manufactured product makes the purity and softness of the water of even more importance than in the treatment of natural fibers. The difficulties introduced in dyeing are much the same for rayon as for other textile materials.

The boiling-off, bleaching, and dyeing of cotton and cotton goods are adversely affected by calcium, magnesium, and iron in the water used.

It is impossible to soften water by the lime-soda process sufficiently to render it satisfactory for textile production. The natural water at present available to nearly every textile plant is much lower in hardness than the best product of a lime-soda softener operated without heating. It is, however, possible to soften fairly hard waters by a zeolite softener so that they are less hard than the best naturally soft supplies.

Modern methods of water treatment make it possible to treat almost any natural water so as to reduce its turbidity, color, hardness, and iron sufficiently for use in a textile plant. The cost of treatment depends on the quality of the natural water; for some waters the treatment will require such constant skillful supervision as to add very appreciably to the cost of mill operation.

(To be concluded in September)

[15] Applebaum, S. B.: "Purifying Water for the Textile Industry."—*Water Works and Sewerage*, vol. 79, pp. 47-51, 83-86, 1932.

Bureau of Census Establishing Municipal Reference Library and Information Service

In an article entitled "Washington Gathers Municipal Data," in *The Public Opinion Quarterly* for July, 1937, Albert Lepawsky, of the Public Administration Clearing House, calls attention to the establishment, under the sponsorship of the Bureau of the Census, of a project for the collection and cataloging of municipal reports and documents. One hundred ninety-one cities over 50,000 population are included in this project, which is being conducted as a part of the Federal Writers' Project, and the documents are now being turned in at Washington. They will be accumulated in the offices of the Bureau of the Census, which is now engaged in formally establishing a Municipal Reference Library and Information Service. This unit may be the nucleus of an official national agency that may outgrow the function of compiling and rendering statistical and general information and may extend further into essential advisory services of the type already being furnished to cities by dozens of other Federal bureaus.

Sanitary Refuse Truck Loads While Entirely Closed

Mechanical Low Loading Saves the Time of One Man and the Very Real Danger of Hernia

By LORON G. KURTZ
Deputy Commissioner, Department of Sanitation, New York City

NOT much more than a year ago the 2,200 motor vehicles of this department were obsolete. In fact, only 70 of them were up to our present requirements. There had been few purchases since 1931, and solid tires had wracked the stiffening and life out of most of the steel bodies. This old equipment was not only inadequate for the modern requirements of refuse collection, street cleaning and snow loading; but it was noisy as well, which is against the policies of the LaGuardia administration.

Consequently, when the present management took over the Department of Sanitation, the first move was to design a new type of collection truck, this being the predominating vehicle. New York City uses 1,800 collection trucks for the daily job. We decided on two sizes of trucks of the same type, having closed steel sanitary bodies. The larger truck has a gross capacity of 40,000 pounds, or 24 cubic yards, and a wheelbase of 170 inches. The smaller truck is of half this capacity, 20,000 pounds, or 12 cubic yards, and a wheelbase of 121 inches, permitting short turning in alleys. We designed these ourselves and, on open specifications, purchased 315 big trucks from General Motors and 105 of the smaller trucks from the White Co.

These trucks load through side doors and through the top. For snow loading, the entire roof panel is removed, leaving the top wide open except for two reinforcing members. They were delivered in March, 1937; but by that time, only about five months ago, we had not only improved the body design but had radically changed the whole idea of loading.

THE SANITARY TRUCK IS EASILY LOADED

TAILGATE RAISED PREPARATORY TO DUMPING

Chain Conveyor Distributes Load

In June, 300 more heavy-duty GMC chassis were ordered on which will be mounted enclosed bodies equipped with mechanical loaders. The loaders are simple chain conveyors running up from the bottom rear of the truck on a 30-degree angle, to the top and along the top to the front end. The material is dumped in at the bottom, is carried up and starts falling as soon as there is space, loading continuously toward the front until the entire body is filled. The chains travel at 660 feet per minute.

An experimental truck has already proved the advantages of this design, which though simple is the only one of its kind in the country. The first advantage is that the truck is really closed. The only opening, other than the hopper attached to the tailgate, is a door on the side, well up to the front, through which such objects as bedsprings, branches and baby carriages can be loaded. Incidentally, the chain is designed so that in the event of large chunks of material entering the hopper, springs permit the hopper to lower and free the offending mass and carry it up onto the conveyor, after which the springs return to normal position.

The second advantage is the low-loading point, only 40 inches above ground. This removes a great deal of the strain of lifting and is expected to cut down materially the present high rate of hernia in the department, amounting to 235 cases a year; 40 per cent of the 14,000 men have been herniated. The third advantage is that as the load is distributed mechanically, it will no longer be necessary to put a man inside the truck; thus releasing this third man for much-needed street-cleaning work. The fourth advantage is that 25 per cent more material can be placed, without the top man, in 20 per cent less space or in a body a fifth smaller than those now in use. The fifth advantage is the better appearance of this closed sanitary truck. Dumping is a simple matter of elevating the front end of the truck by means of hydraulic pistons, and raising the tailgate, leaving the rear end open.

No figures are yet available on maintenance and operating costs. Against the increases in these items, which may be attributable to the loading mechanism, there will be the solid economies of a smaller crew, less exposure to illness and injury, and a closed sanitary collection truck in keeping with a progressive city and the times.

Water-Works Operating Records for Progress and Protection

By R. L. DOBBIN
General Manager, Peterborough Utilities Commission, Peterborough, Ontario

EFFICIENT operation of a water-works plant is impossible without records. They measure progress and show its direction, and give warning of wrong methods, unwise procedure, and inefficient operations. Attention is drawn to extremes; the way is shown to short cuts, and waste is located.

Records themselves are of little value. It is the data they supply and the use to which they are put that establishes their value. They should be summarized often, and at regular periods, and put in such shape that their meaning can be seen with very short study. Records manually made are not usually as reliable as those made automatically by recording gages, and these latter instruments should be used when possible.

Each water-works plant makes certain operating records that are especially significant in its own case, but there are some records that every plant should have. Most important is the amount of water delivered to the distribution system, and this should be automatic, giving the rate of pumpage at every instant, together with the total for the day. This will be a record of the manufactured product of the plant, and on it all costs are based.

A study of the daily pumpage will determine whether there is undue waste. For instance, the average rate of pumpage between midnight and six o'clock in the morning in months when there is no lawn watering or freezing weather should not be more than 15 per cent of the maximum rate during the rest of the day. If it exceeds this figure by very much, then it is evident that there is considerable leakage in the system.

Permanent Records

Recording pressure gages in the pump house and at various points in the system are very useful. The gage in the pump house will be very useful in settling disputes as to water pressures at fires, and also as a check on the operators. The gages out on the system will provide data as a basis for strengthening or re-building the mains.

At the pump house, records will be kept of all the operations here and care should be taken that they are all of use. Voluminous records and complicated charts are not to be desired. A judicious weeding-out of all records found to be non-essential would be advisable in many pumping stations. For instance, a record of the cost of operation of pumping machinery will often lead to economies, and sometimes point out the advantage of replacing the unit with one of more modern design. Where electrical power is purchased, often a considerable economy can be secured by operating certain units in the proper manner and at the proper time. Adequate records are valuable in this case.

At the filter plant, records having to do with the amount of water filtered, chemicals and power used are necessary. The bacteriological and chemical characteristics of the raw and filtered water will be recorded, and from these the efficiency of the purification process determined.

Protection

The possession of good records has helped many a water-works superintendent when aspersions are cast on the service or quality of the water. Sudden outbreaks of dysentery or other diseases of that kind will be first blamed on the water supply, and unless the superintendent has a record showing that the quality is up to standard, he will have difficulty in proving the water-works system not to blame.

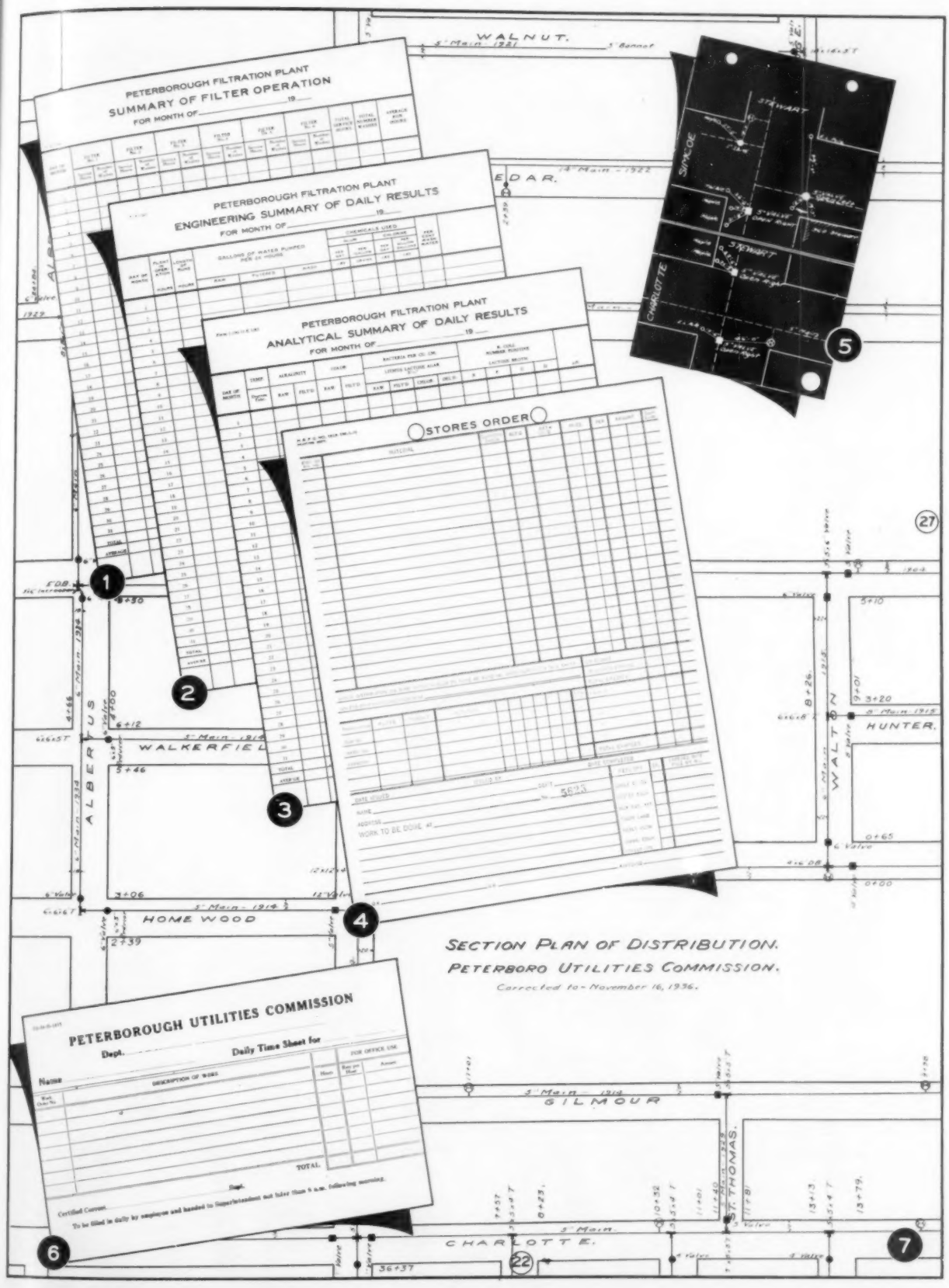
In every city there are always persons who periodically discover some taste or odor in the water. These complaints are sometimes genuine, but most of them are based on hallucinations of one kind or another. A proper record will usually be instrumental in persuading the complainant that nothing serious is wrong.

Governmental commissions have done good work in requiring annual reports from water-works systems giving records of all kinds, and thus guiding the superintendent in setting up a new system. Water-works associations have also undertaken similar activities with excellent results.

ACKNOWLEDGMENT.—A paper presented before the International Association of Public Works Officials in Toronto, Ontario. See pages 60 and 61 for reproductions of record forms used by Peterborough Utilities Commission.

FORMS USED BY THE PETERBOROUGH UTILITIES COMMISSION IN THE OPERATION OF ITS WATER WORKS

1. Monthly record of new water services. 2. Shut-off notice for repair of water mains. 3. Blueprint carried by trucks and foremen, showing location of valves at and near street intersections. 4. Frozen service notice. 5. Page from loose-leaf book carried by meter reader. 6. Water service record. 7. Individual meter record. 8 and 8A. Face and reverse of record locating shut-off cock for domestic service. 9 and 9A. Front and reverse of loose-leaf record of water-works stores



FURTHER RECORDS FOR THE OPERATION OF THE WATER WORKS OF THE PETERBOROUGH UTILITIES COMMISSION

1. Daily report of filter operation. 2. Daily report of filtration plant operation. 3. Daily report of chemical and bacteriological analyses. 4. Standard order for materials from Utilities Commission stores. 5. Blueprint field-book record of location of valves. 6. Daily time sheet for maintenance and special order gangs. 7. The forms are mounted on one of the large sheets covering one section of the distribution system

Municipal Services in 18 Cities Compared

THE tables on this and the facing page are from one of the appendices of a report on "Fiscal Relations Between the United States and the District of Columbia," recently submitted to President Roosevelt by an Advisory Committee comprising George McAneny, Clarence A. Dykstra and James W. Martin, with J. L. Jacobs as director of the survey.

In attempting to evaluate the services received by the residents and property owners in the District of Columbia in comparison with those of 17 other municipalities in the 300,000-900,000 population group, members of the field staff enlisted the effective cooperation of local officials and bureaus of governmental research, supplemented by examination of the literature on the measurement of governmental services.

In selecting criteria for these studies, purely objective tests were chosen. "The need for such an approach," says the report, "is indicated by the frequency with which the officials and citizens of many cities declare with conviction that they have the best police, fire, health, or other city department in existence."

Street pavement statistics of the District of Columbia and 16 comparable cities—1935 [1]

STREETS

	District of Columbia	Average, other reported cities	Cleveland, Ohio	St. Louis, Mo.	Baltimore, Md.	Boston, Mass.	Pittsburgh, Pa.	Milwaukee, Wis.	Buffalo, N. Y.	Minneapolis, Minn.	New Orleans, La.	Cincinnati, Ohio	Newark, N. J.	Kansas City, Mo.	Seattle, Wash.	Indianapolis, Ind.	Rochester, N. Y.	Jersey City, N. J.
Miles of surfacing:																		
Concrete	158.11	94.85	12.00	86.50	145.48	9.78	26.35	177.40	1.89	17.46	11.42	156.43	9.64	234.31	525.00	78.24	23.03	0
Sheet asphalt	322.36	215.40	62.00	321.64	469.63	146.46	264.02	190.70	455.60	124.60	131.44	65.83	106.18	218.64	163.00	[2]234.59	241.73	76.05
Bitulithic	0	8.24	0	0	0.13	0	0	0	0	0	104.54	0	0	0	0	0	16.11	0
Bituminous concrete	94.27	22.60	3.00	96.03	21.36	120.44	0	0	0	0	8.83	4.78	51.25	0	37.00	0	0	0.97
Bituminous macadam	104.19	58.52	2.00	[3]171.35	63.63	166.21	0	230.50	10.70	15.37	0	.71	3.84	225.80	18.25	25.10	28.10	8.32
Brick	0	100.23	666.00	188.90	77.25	.97	154.19	12.10	54.20	36.06	22.97	79.46	45.74	53.00	67.00	60.40	77.16	64.29
Stoneblock (including granite)	7.06	58.32	152.00	52.91	66.08	86.96	264.95	21.20	25.62	7.55	10.79	78.31	61.27	5.86	18.88	0	14.21	0
Cobblestone or irregular block	0	3.52	0	0	16.15	.02	16.10	0	0	0	0	22.73	.20	0	0	0	0	0
Wood block	0	9.07	0	7.73	2.67	2.32	4.20	8.00	.06	81.38	17.30	10.20	2.01	2.43	1.22	0	2.07	2.32
Waterbound macadam	0	32.31	11.00	0	28.41	123.74	10.18	0	0	0	0	330.91	5.24	15.04	0	0	0	2.45
Other surfacing	0	13.84	103.75	0	11.11	.79	2.20	2.00	18.20	0	9.26	26.80	5.90	2.83	16.20	0	21.67	.20
Hard surfacing	685.99	617.87	1,012.75	926.06	940.88	663.71	742.19	631.90	567.07	282.43	316.67	767.16	351.46	757.91	866.55	698.33	426.88	164.23
Gravel and unpaved	[4]112.20	210.79	144.25	123.12	61.61	28.45	.....	183.00	.....	688.26	.....	152.00	.....	142.81	682.60	304.44	.91	58.67
Total	798.29	[5]828.66	1,157.00	1,049.18	972.49	692.16	.....	814.90	.....	970.69	.....	919.16	.....	900.72	1,528.55	802.77	427.79	202.90
Miles per 1,000 population:																		
Hard surfacing	1.154	1.041	1.166	1.132	1.075	.079	1.136	1.053	.088	.611	.680	1.726	.756	1.689	2.399	1.336	1.185	.541
Gravel and unpaved	.199	.385	.166	.160	.072	.003	.....	.305	.....	1.490	.....	.342	.....	.318	1.832	.816	.002	.129
Total	1.343	[6]1.427	1.332	1.283	1.148	.082	.....	1.359	.....	2.102	.....	2.068	.....	2.007	4.231	2.153	1.187	.674
Miles per square mile of city area:																		
Hard surfacing	11.064	12.308	13.858	15.089	11.571	15.118	14.237	14.580	14.345	5.059	1.585	10.678	20.589	12.944	12.650	9.495	12.469	12.631
Gravel and unpaved	1.811	3.736	1.973	2.006	.762	.648	.....	4.222	.....	12.427	.....	2.115	.....	2.439	9.664	5.801	.026	2.874
Total	12.875	16.064	15.831	17.095	12.353	15.767	.....	18.802	.....	17.527	.....	12.794	.....	15.383	22.314	15.296	12.495	15.505

[1] Data were not obtained for San Francisco.
[2] Includes bituminous concrete.
[3] Includes waterbound macadam.
[4] Includes unimproved streets.
[5] Analysis of information contained in Automobile Facts and Figures, 1936, pp. 80-81, leads to the following comparison with respect to paved and unpaved streets as of Jan. 1, 1936: District of Columbia—Street mileage: Paved, 686.0; unpaved, 112.3; total, 798.3. Average of other 17 cities—Street mileage: Paved, 613.3; unpaved, 213.3; total, 826.6. In view of these data and the lack of information on unpaved streets in Pittsburgh, Buffalo, New Orleans, and Newark, it appeared advisable to use the total of the averages of hard surfacing and gravel and unpaved, 828.66 miles, to represent the average total street mileage in 17 cities.
[6] See footnote 5.

Source: United States-District of Columbia Fiscal Relations Field Study.

Park statistics of the District of Columbia and 17 comparable cities—1935

PARKS

	Number of parks	Park acreage	Population per acre of parks	Percent of city area in parks	Capital expenditures, 5 years 1926-30 (in thousands)
District of Columbia	[1]691	5,628	106.54	14.18	$5,673.40
Average of reported cities, excluding District of Columbia	66.82	2,784.67	2,661.13	7.95	2,209.66
Average reported cities, excluding District of Columbia, Newark, and Jersey City	74.64	3,178.47	212.82	9.04	2,447.54
Cleveland, Ohio	39	3,629.50	226.66	8.19	5,255.80
St. Louis, Mo.	91	[2]2,624.8	326.99	6.12	499.06
Baltimore, Md.	113	3,648	272.21	7.24	2,126.19
Boston, Mass.	314	6,732.82	124.46	23.56	3,227.20
Pittsburgh, Pa.	30	1,889.48	340.19	5.60	1,739.70
San Francisco, Calif.	.....	.....	.....	.....	5,217.60

City	Number of parks	Park acreage	Population per acre of parks	Percent of city area in parks	Capital expenditures, 5 years 1926-30 (in thousands)
Milwaukee, Wis.	81	1,745	343.61	6.29	$6,482.30
Buffalo, N. Y.	10	2,009	317.62	7.94	450.62
Minneapolis, Minn.	144	5,232.46	88.94	14.78	2,265.50
New Orleans, La.	17	2,025.11	226.56	1.58	2,130.40
Cincinnati, Ohio	115	3,985	111.47	8.67	2,731.20
Newark, N. J.	3	21	22,128.57	.19	900.00
Kansas City, Mo.	78	3,677.11	122.03	9.81	.....
Seattle, Wash.	42	1,772.95	203.73	4.04	2,932.40
Indianapolis, Ind.	30	1,011	195.08	5.69	1,061.00
Rochester, N. Y.	31	3,651.73	98.64	16.66	282.20
Jersey City, N. J.	18	3,004	7,710.04	.47	175.00

[1] As of November 1935. These parks are under the supervision of the National Capital Parks.
[2] Excludes airport, Union Station Plaza, and Municipal Plaza.

Source: United States-District of Columbia Fiscal Relations Field Study. Capital expenditures from Bureau of Labor Statistics, Bulletin No. 565, "Park Recreation Areas in the United States." (1930.)

Recreation statistics of the District of Columbia and 17 comparable cities—1935

RECREATION

	District of Columbia	Average, other reported cities	Cleveland, Ohio	St. Louis, Mo.	Baltimore, Md.	Boston, Mass.	Pittsburgh, Pa.	San Francisco, Calif.	Milwaukee, Wis.	Buffalo, N. Y.	Minneapolis, Minn.	New Orleans, La.	Cincinnati, Ohio	Newark, N. J.	Kansas City, Mo.	Seattle, Wash.	Indianapolis, Ind.	Rochester, N. Y.	Jersey City, N. J.
Attendance (thousands):																			
Playgrounds	3,616	2,538.43	3,261	4,090	730	.....	1,760	5,063	3,831	5,262	3,979	1,088	997	3,362	805	.....	727	.....	943
Recreation buildings	10	630.90	.....	1,573	145	235	1,857	.....	1,213	272	.....	86	177	.....	.....	638	243	.....	.....
Indoor recreational centers	877	610.67	303	.....	1,627	599	.....	172	1,045	783	185	.....	464	.....	245	.....	.....	.....	32
Non-emergency recreation workers:																			
Number paid	494	260.88	443	476	251	258	398	292	970	108	69	27	333	199	154	67	55	.....	74
Number full time	85	40.13	91	26	24	33	45	123	70	38	17	23	19	58	2	17	4	.....	12
Number volunteers	97	62.64	2	27	1	.....	2	14	.....	.....	40	70	363	150	.....	12	.....	.....	9
Emergency recreation workers:																			
Number paid	154	19.59	63	252	52	372	20	1,256	12	120	281	20	261	58	104	25	.....	.....	43
Number full time	72	74.20	18	.....	33	160	.....	375	.....	15	34	20	4	40	.....	.....	.....	.....	43
Number of playgrounds under leadership:																			
Year-round	36	15.75	1	3	1	61	12	59	23	2	26	17	9	32	0	0	0	.....	3
Summer only	46	37.25	88	83	56	0	102	0	43	68	27	14	22	8	30	0	38	.....	17
Other	10	11.56	0	0	35	0	0	0	0	0	0	0	53	0	59	27	0	.....	11
Total	92	64.56	89	86	92	61	114	59	66	71	53	31	84	40	89	27	38	.....	31
Number of recreation buildings	1	10.23	8	5	3	11	13	20	4	5	26	1	18	.....	.....	7	8	.....	.....
Number of indoor recreation centers	89	72.33	27	.....	302	40	62	26	29	108	63	.....	135	37	66	.....	.....	.....	13
Athletic fields	5	5.17	8	.....	7	.....	10	8	11	2	.....	.....	2	4	.....	3	1	1	6
Baseball diamonds	37	32.10	27	41	27	120	43	30	10	53	42	6	42	1	.....	23	23	4	10
Golf courses—9 holes	10	1.5	2	1	3	.....	.....	.....	1	2	.....	.....	1	.....	.....	1	2	.....	.....
Golf courses—18 holes	.....	2.38	2	1	3	4	.....	3	1	2	5	2	1	.....	.....	2	4	1	.....
Bathing beaches	.....	6.00	5	.....	1	27	.....	4	5	1	4	.....	.....	.....	.....	10	1	2	.....
Indoor swimming pools	1	3.89	6	6	.....	2	28	.....	.....	10	2	.....	10	.....	6	.....	.....	.....	10
Outdoor swimming pools	7	7.62	7	2	7	2	19	3	1	6	1	8	38	.....	.....	.....	5	1	.....
Tennis courts	86	74.60	67	66	104	182	13	111	117	66	177	47	85	3	.....	96	74	6	25
Wading pools	14	7.77	3	38	.....	1	8	1	13	9	16	7	.....	.....	4	7	2	1	.....
Number of paid nonemergency workers per 10,000 population	8.31	4.29	5.10	5.82	2.96	3.07	6.09	4.70	16.17	1.09	1.49	.59	7.49	4.28	3.43	1.85	1.47	.....	2.45

Source: Recreation Magazine, Yearbook Number, June 1936.

Police statistics of the District of Columbia and 17 comparable cities—1935

POLICE

	District of Columbia	Average, other reported cities	Cleveland, Ohio	St. Louis, Mo.	Baltimore, Md.	Boston, Mass.	Pittsburgh, Pa.	San Francisco, Calif.	Milwaukee, Wis.	Buffalo, N. Y.	Minneapolis, Minn.	New Orleans, La.	Cincinnati, Ohio	Newark, N. J.	Kansas City, Mo.	Seattle, Wash.	Indianapolis, Ind.	Rochester, N. Y.	Jersey City, N. J.
Police employees per 10,000 population	22.54	19.90	16.89	28.00	22.36	27.79	16.52	21.93	19.31	19.85	10.80	18.35	14.11	27.88	15.06	16.41	14.53	12.60	24.16
Police employees per square mile	22.55	27.60	22.08	37.31	24.08	53.05	20.69	32.40	26.70	32.05	9.01	4.22	8.73	75.92	11.54	8.08	10.32	13.25	79.15
Number of:																			
Police cars	113	101.6	155	226	157	163	45	110	65	86	66	45	112	108	100	58	61	39	.....
Motorcycles	63	38.8	45	91	58	37	50	48	59	38	21	26	35	27	22	15	31	18	.....
Mounts	0	13.5	44	21	11	14	25	56	6	15	0	16	0	8	0	0	0	0	.....
Stations	14	9.4	16	14	9	15	11	14	7	19	4	11	8	5	5	6	4	6	.....
Radio equipment:																			
Number of cars	62	80.1	116	202	81	77	45	79	44	86	66	45	108	108	100	29	56	39	.....
Number of motorcycles	1	9.3	1	12	0	0	0	1	50	0	0	26	6	3	18	0	31	0	.....
Number of offenses known to police (rate per 100,000 population):																			
Murder, nonnegligent manslaughter	9.9	6.1	9.2	8.8	4.7	2.3	5.7	2.7	.3	2.0	2.0	16.4	15.1	7.3	.....	5.5	7.3	2.5	.....
Rape	2.5	5.1	3.7	12.2	6.8	10.1	6.3	2.1	5.0	6.1	1.0	2.6	8.1	2.4	.....	2.2	5.9	2.7	.....
Robbery	122.6	72.6	163.5	75.3	41.2	30.9	162.1	55.5	6.5	17.9	82.4	28.6	88.7	72.0	.....	114.7	141.7	7.8	.....
Aggravated assault	41.1	41.3	27.9	39.3	3.9	23.3	22.5	39.8	12.9	31.0	26.5	104.8	71.4	98.7	.....	35.5	69.1	12.2	.....
Burglary—breaking or entering	470.4	321.8	341.7	244.7	240.7	159.7	260.6	297.9	123.9	114.7	375.5	160.5	330.0	512.7	.....	863.4	539.2	262.5	.....
Larceny—theft, $50 and over	204.2	75.1	33.5	(1)	98.9	112.5	92.3	(1)	44.1	28.1	86.0	69.0	150.8	(1)	.....	.....	(1)	24.4	.....
Larceny—theft, under $50	1,023.0	546.6	1,423.7	(1)	370.1	270.2	173.9	(1)	735.7	228.5	173.8	197.4	960.9	(1)	.....	.....	(1)	565.8	.....
Auto theft	448.6	330.6	311.5	226.9	305.9	475.4	336.0	576.3	131.2	180.4	537.5	166.4	241.4	377.8	.....	457.3	418.0	217.8	.....
Number of fatalities:																			
1931	85	115.2	230	170	177	120	174	104	86	108	87	88	115	95	102	93	109	35	45
1932	122	96.8	207	151	137	124	125	131	82	98	73	61	91	86	72	69	61	32	53
1933	86	79.5	190	145	120	110	121	123	73	104	82	73	110	87	101	74	76	30	56
1934	126	112.2	235	180	154	143	107	106	66	117	80	94	133	88	97	120	97	46	64
1935	102	109.4	200	164	137	137	133	111	66	108	91	94	125	113	87	84	121	45	44
Five-year average	103.0	106.6	216.4	158.0	147.0	126.8	132.0	113.0	74.6	107.0	82.4	82.4	94.6	114.0	91.8	88.8	92.8	37.6	52.4

[1] Large and small larcenies not reported separately.

Source: United States-District of Columbia Fiscal Relations Field Study, and Uniform Crime Reports for United States and Possessions, vol. VI, no. 4, Fourth Quarterly Bulletin, 1935. Data on fatalities from reports of the National Safety Council.

Fire statistics of the District of Columbia and 17 comparable cities—1935

FIRE

	District of Columbia	Average, other reported cities	Cleveland, Ohio	St. Louis, Mo.	Baltimore, Md.	Boston, Mass.	Pittsburgh, Pa.	San Francisco, Calif.	Milwaukee, Wis.	Buffalo, N. Y.	Minneapolis, Minn.	New Orleans, La.	Cincinnati, Ohio	Newark, N. J.	Kansas City, Mo.	Seattle, Wash.	Indianapolis, Ind.	Rochester, N. Y.	Jersey City, N. J.
Number of:																			
Firemen	884	824.47	1,064	925	1,463	1,593	836	1,145	702	955	560	699	648	710	531	573	689	484	508
Alarms, excluding false alarms	4,860	3,873.70	5,234	5,074	5,829	8,165	3,253	6,918	2,217	2,841	3,868	2,059	3,279	3,067	3,139	3,314	2,865	2,201	1,530
Stations	38	42.50	42	51	76	61	53	54	37	56	26	43	37	30	29	36	30	37	27
Engine companies	30	37.33	38	51	54	53	54	.....	34	55	21	41	38	29	29	32	31	29	.....
Ladder companies	[1] 14	19.0	32	36	26	31	31	.....	15	14	11	11	14	12	10	11	16	15	.....
Value of equipment (thousands of dollars)	1,580.0	1,852.2	3,500.0	.....	1,873.9	2,750.0	[2] 700.0	7,958.4	1,207.2	2,670.0	628.2	804.4	1,750.6	901.8	.....	1,187.2	612.5	545.0	700.9
Average fire losses 5-year average 1931–35 (thousands of dollars)	360.2	1,060.8	1,636.3	1,396.8	1,639.3	3,225.0	752.0	.....	860.5	1,055.2	1,111.9	557.8	597.9	816.2	1,114.0	636.8	521.0	446.6	416.2
Rating by National Board of Fire Underwriters:[4]																			
Overall classification	2d	7-2ds 9-3ds 2-4ths 2-5ths	3d	4th	3d	3d	3d	3d	2d	2d	3d	4th	3d	3d	3d	2d	3d	2d	2d
Fire Department points of deficiency	203	319	718	501	183	.....	440	185	122	299	264	451	398	231	326	300	230	312	169
Firemen per square mile	14.25	18.55	14.55	15.07	18.58	30.28	16.03	27.26	18.27	24.15	9.02	3.45	9.02	41.59	9.07	8.36	11.43	14.12	39.07
Persons protected per fireman	672	701	816	884	579	526	781	542	747	668	923	666	686	655	845	630	621	744	593
Stations per square mile	0.61	0.94	0.57	0.83	0.97	1.38	1.01	1.28	0.85	1.39	0.43	0.22	0.52	1.76	0.49	0.52	0.57	1.07	2.07
Persons protected per station	15,632	13,355	20,667	16,031	11,146	13,736	12,317	11,493	13,828	11,602	19,238	10,670	12,008	15,490	15,472	10,033	12,427	9,735	11,148
Persons protected per engine and ladder company	13,500	10,309	12,460	9,398	10,589	8,056	7,680	.....	12,237	13,022	14,428	8,823	8,544	11,334	11,505	8,400	7,932	10,291	.....
Equipment value per capita	$2.58	$3.16	$4.03	.....	$2.21	$3.28	$1.07	$12.81	$2.01	$4.18	$1.36	$1.75	$3.94	$1.94	.....	$3.29	$1.64	$1.51	$2.33
Alarms per fireman	5.5	4.74	4.9	5.5	4.0	5.1	3.9	6.0	4.1	3.0	7.7	2.9	5.1	4.3	5.9	5.8	4.6	4.5	3.0
Loss per alarm, 5-year average, 1931–35	$60	$263	$299	$258	$333	$403	$215	.....	$180	$400	$248	$284	$301	$274	$294	$210	$166	$196	$225
Loss per capita, 5-year average, 1931–35	$0.66	$1.83	$1.88	$1.71	$2.21	$4.06	$1.14	.....	$1.48	$1.72	$2.36	$1.22	$1.32	$1.79	$2.59	$1.77	$1.41	$1.28	$1.36
Loss per fireman, 5-year average, 1931–35	$405	$1,256.56	$1,587	$1,472	$1,208	$2,053	$889	.....	$1,081	$1,112	$2,163	$805	$929	$1,067	$2,155	$990	$870	$886	$778

[1] Figures for 1932; averages for 1930–32, inclusive.
[2] Includes one city service.
[3] 1934.
[4] As reported in Yearbook of International City Managers Association, August 1936

Source: Basic data furnished by International Association of Fire Fighters.

Health statistics of the District of Columbia and 17 comparable cities

HEALTH

	District of Columbia	Average, other reported cities	Cleveland, Ohio	St. Louis, Mo.	Baltimore, Md.	Boston, Mass.	Pittsburgh, Pa.	San Francisco, Calif.	Milwaukee, Wis.	Buffalo, N. Y.	Minneapolis, Minn.	New Orleans, La.	Cincinnati, Ohio	Newark, N. J.	Kansas City, Mo.	Seattle, Wash.	Indianapolis, Ind.	Rochester, N. Y.	Jersey City, N. J.
Birth rate, 1935	18.19	16.23	16.69	15.69	16.18	18.91	18.83	11.47	15.67	16.80	15.93	19.53	17.21	16.46	12.77	13.87	15.73	13.79	22.34
Death rate per thousand population:																			
Average, 1926–34	15.0	12.9	10.7	13.8	14.0	14.3	13.5	13.0	9.7	13.0	10.8	17.5	16.1	11.5	13.3	10.9	13.7	11.6	11.5
1935	14.28	12.48	11.50	12.98	13.16	13.69	12.87	[1] 13.70	8.48	[1] 11.26	11.09	17.27	15.99	10.31	11.21	12.80	14.20	[1] 10.11	11.59
Infant mortality rate per thousand live births:																			
Average, 1926–34	70.3	61.8	55.6	59.4	72.0	68.0	68.4	43.0	61.4	68.7	52.1	85.6	70.8	53.9	65.6	42.0	64.8	55.4	63.4
1935	59.42	51.30	44.17	51.91	56.48	51.36	49.95	35.41	45.83	51.48	42.96	77.13	61.22	50.86	58.26	41.41	66.48	46.10	60.69
Tuberculosis death rate, 1926–33	122.8	78.8	85.7	74.2	99.1	80.5	69.8	91.9	55.2	80.3	33.3	146.6	109.7	67.8	86.4	63.1	94.4	46.0	72.1
Average number communicable-disease cases reported, 1931–35 (5-year averages):																			
Typhoid	61.4	49.52	75.2	108.6	79.0	43.2	45.4	336.0	7.8	19.2	55.8	164.8	36.2	16.4	.....	32.2	.....	17.4	8.0
Diphtheria	561.0	247.96	267.0	796.4	206.8	417.8	300.4	884.0	77.4	157.6	253.6	597.0	233.8	67.8	.....	19.2	.....	38.0	208.2
Whooping cough	600.8	1,530.70	3,043.2	1,222.4	2,955.6	1,895.2	1,586.6	10,392.0	3,305.2	1,267.2	.....	108.2	346.0	2,071.2	.....	940.8	.....	.....	116.2
Influenza	170.4	565.0	.....	94.4	1,632.4	[2] 333.0	.....	8,404.0	98.6	.....	.....	601.2	.....	.....	.....	.....	.....	.....	.....
Pneumonia	1,207.2	721.77	.....	[3] 693.6	1,178.8	1,280.4	.....	2,920.0	311.8	.....	.....	574.0	.....	.....	.....	.....	.....	.....	.....
Smallpox	.2	23.85	1.2	21.4	.....	.....	.....	[4] 64.5	2.6	12.8	11.4	59.4	2.0	1.6	.....	61.6	.....	.....	.....
Scarlet fever	931.2	1,493.89	2,946.6	1,459.0	1,694.2	3,024.6	1,975.0	4,738.0	2,845.4	1,782.6	1,432.0	359.2	1,209.2	842.6	.....	457.8	.....	1,402.6	420.8
Measles	2,501.4	3,273.03	6,098.4	3,114.2	6,891.4	3,875.2	4,605.2	2,574.0	5,967.8	2,969.2	5,433.6	317.2	1,185.8	3,375.0	.....	2,097.4	.....	2,123.4	773.2
Venereal diseases	7,294.2	3,868.05	.....	10,149.2	6,503.8	4,380.6	.....	32,356.0	111.2	.....	2,733.0	2,458.4	.....	.....	.....	1,395.4	.....	.....	.....
Spinal meningitis	75.6	26.41	.....	70.8	54.0	27.6	43.2	174.0	17.8	12.4	14.8	34.0	63.4	13.4	.....	12.8	.....	.....	10.8
Poliomyelitis	32.6	43.49	30.2	13.8	21.4	284.0	25.0	394.0	22.2	13.0	52.8	16.2	12.6	41.8	.....	[5] 38.5	.....	11.8	29.6

[1] Figures provisional. [2] 2-year average, 1931–32. [3] 3-year average, 1933–35. [4] 4-year average, 1932–35.

Source: United States-District of Columbia Fiscal Relations Field Study; United States Census Bureau, unpublished statistics of births, deaths, and infant mortality, 1935; and unpublished data of the Department of Health, District of Columbia.

Street lighting statistics of the District of Columbia and 16 comparable cities [1]—1935

LIGHTING

	District of Columbia	Average, 16 other cities	Cleveland, Ohio	St. Louis, Mo.	Baltimore, Md.	Boston, Mass.	Pittsburgh, Pa.	Milwaukee, Wis.	Buffalo, N. Y.	Minneapolis, Minn.	New Orleans, La.	Cincinnati, Ohio	Newark, N. J.	Kansas City, Mo.	Seattle, Wash.	Indianapolis, Ind.	Rochester, N. Y.	Jersey City, N. J.
Number of lighting units:																		
Gas	0	2,223	141	3,216	17,148	9,471	0	0	0	0	0	3,744	0	1,721	0	0	0	133
Electric	29,836	16,559	24,357	43,314	20,909	13,747	18,253	17,075	19,994	7,381	8,903	12,695	7,001	15,184	26,061	8,502	19,398	4,191
Total gas and electric units	29,836	18,782	24,498	46,530	38,057	23,218	18,253	17,075	19,994	7,381	8,903	16,442	7,001	16,905	26,061	8,502	19,398	4,324
Miles of street lighted	500	793.50	1,015	956.74	[2] 950	980	[3] 1,330	645	670	811.39	696	662	360	800	[4] 1,472	[2] 600	524.95	202.90
Total cost of lighting last fiscal year (in thousands of dollars)	[5] $729	$633	$1,061	$832	$1,274	$995	$759	$354	$712	$336	$375	$347	$460	$660	$375	$326	$850	A$90
Gas and electric units per 1,000 population	50.23	33.08	28.22	56.91	44.93	27.71	27.95	28.48	31.93	15.99	19.40	37.01	15.07	33.22	72.15	22.81	53.77	14.37
Gas and electric units per square mile	481.22	306.02	335.22	758.19	483.45	528.88	340.14	393.98	505.79	133.28	44.88	226.84	419.13	254.57	380.45	162.00	565.32	132.62
Yearly lighting cost per unit	$24.44	$36.79	$42.49	$17.89	$33.49	$42.86	$41.60	$20.74	$35.61	$45.49	$42.12	$33.27	$57.13	$44.28	$14.39	$38.34	$43.80	$7.07
Street miles lighted per 10,000 population	[6] 10.10	14.98	11.69	11.70	11.21	11.70	20.68	10.76	10.80	17.57	15.17	14.90	7.75	17.83	60.75	15.69	14.67	[7] 4.74
Street miles lighted per square mile	[8] 9.68	15.47	13.80	15.59	12.07	22.32	25.90	14.98	16.96	14.65	3.48	9.21	21.09	13.66	21.69	11.43	15.32	11.61
Yearly lighting cost per capita	$1.23	$1.13	$1.20	$1.02	$1.50	$1.19	$1.16	[9] .99	$1.12	$0.73	$0.62	$1.23	$0.95	$1.47	$1.04	$0.87	$2.36	$0.95
Yearly lighting cost per square mile	$11,739	$13,529	$14,244	$13,561	$16,190	$22,666	$14,564	$8,172	$18,010	$6,063	$1,678	$7,613	$23,433	$11,272	$5,474	$6,212	$24,810	$22,308

[1] Data were not obtained for San Francisco. [2] Estimated. [3] 52 miles of boardwalk and steps in addition. [4] Computed by special engineering factors. No record of intersection lights. [5] Fiscal year ended June 30, 1936. [6] Includes alleys.
Source: United States-District of Columbia Fiscal Relations Field Study.

The Rise and Fall of "Mt. Corona"

The Story of the World's Greatest Refuse-Disposal Project, in Brooklyn, N. Y.

ONE-QUARTER of the area being developed as Flushing Meadow Park to provide a site for the New York World's Fair of 1939 bears an interesting history. In 1906, this section of some 300 acres was entirely marsh and salt meadow-land lying considerably below grade. As the result of operations of the Brooklyn Ash Removal Co., this entire stretch of meadow-land was brought to an average elevation of 12 feet above grade. This involved the placing of some 50,000,000 cubic yards of refuse over a period of 26 years.

The activities of the Brooklyn Ash Removal Co. were outstanding in modern times and had no counterpart elsewhere in the world. Along the banks of the Thames in the city of London, similar operations are carried on today. However, the scale of this work is only about one-quarter of the Corona operation. It is interesting to note the progress of this particular company from the time of its inception until 1934, when all of its dumping properties were acquired by the city of New York.

The Horse-Drawn Dray Era

The disposal of refuse in the borough of Brooklyn in 1906 was confined entirely to the use of horse-drawn drays. It was the practice in those days to load up the drays with approximately three yards of material and to dispose of it in outlying districts. This was a day's work, which cost the city $1.00 for each cubic yard. Shortly thereafter, cars of the Brooklyn Rapid Transit were used to convey refuse material to three different dumps. This reduced the cost of removal considerably, for it was found that 16 yards could be moved at a cost of $8.00. Great criticism, however, followed because of the use of the so-called "iron juggernauts" on what was ordinarily a trolley line. This agitation continued until 1908, at which time an organization, later to be known as the Brooklyn Ash Removal Co., started operations employing the use of cars of the Long Island Railroad System and the company's own barges to remove Brooklyn's refuse. The greatest problem at that time was to find a suitable dump site. After surveying the entire city, the location on the Flushing River was secured. At that time, it was the breeding place of hordes of mosquitoes and swamp rats. Since much of the property was in the hands of absentee and unknown owners, considerable time and effort were necessary before it could be acquired.

Preparing the Dump Site

The company got off to an ambitious start. Four miles of track were laid through the meadows, five locomotives and thirty-five 100-cubic-yard railway cars were acquired. Twenty 1,000-cubic-yard scows were purchased, and two dock cranes erected to take the refuse material from the scows and place it in the dump-car trains. The Corona Dumps took form in the first year as 2,000,000 yards were spread on the site.

The scows were loaded from different points along the Brooklyn waterfront. Other points in the borough were covered by the railway system. In all, there were eight loading stations.

Increase in Equipment

Some idea of the growth of the company throughout the years is gained through a comparison of 1934 equipment with that in use the first year. At the later date, there were 14 miles of track, 110 100-yard railroad cars, and 35 dump-cars, necessitating the use of 9 dump locomotives, 30 scows, 4 dock cranes, and an elaborate high-pressure water system, to unload the cars and also extinguish the frequent fires which were a constant cause of annoyance to neighboring residents.

An economical step then adopted eliminated hand unloading of the cars at the dumps by using traveling cranes equipped with clam-shell buckets. As it was found that the sides of the cars were continuously damaged by this method, hydraulic mining methods were later employed. Pumps were installed with intakes in the Flushing River and high-pressure lines were laid across the dumps. Through the use of a nozzle mounted on a tractor, together with flexible connections to the pipe lines, refuse was blown out of new side-lift dump-cars by water pressure. This method served the purpose of eliminating the damage caused by the clam-shell buckets to the sides of the cars, and also settled the fill.

"MT. CORONA" PRIOR TO 1935
Now a part of the site for the New York World's Fair of 1939

UNLOADING A CARLOAD OF REFUSE WITH A STREAM FROM A TRACTOR-MOUNTED HYDRAULIC GIANT AT "MT. CORONA"

Civic Objections Arise

The operation of the dumps continued smoothly until the summer of 1919, when public officials of the borough of Queens took exception to the fact that refuse from Brooklyn was being dumped in their borough. From that time on, the company was subjected to the criticism not only of public officials but of civic associations as well, and the objections were carried into court on numerous occasions. The company won every suit but one. This was in 1924, when it was found necessary, because of an emergency, to dump unclassified refuse from the borough of Manhattan for a period of two months. A fine was imposed, and sixty days was given to end this new nuisance.

For five years the company was not molested, but in 1929 the courts ordered leveling-off of the so-called "Mount Corona" to fill adjacent depressions in which flies and mosquitoes bred. At the time of acquisition as park property for the Flushing Meadow improvement, this hill was 90 feet above grade.

Company Improvements

From time to time, the company conducted experiments as to the bacteriological content of the fill. It was found that there were no disease-breeding germs present. This was due, perhaps, to the action of the natural salts found in the water used in the high-pressure hydraulic system. Quantities of a coal-oil product, which was intended to give a pleasing pine aroma, were used to offset the odor prevalent around the dumps.

On November 14, 1930, to forestall further criticism, the company announced that it would construct three golf courses on the now famous Corona Dumps. On September 3, 1931, the Corona Park Golf and Country Club was formally opened by the company, with borough officials, civic workers and business men as their guests. The golf course was lauded as a magical transformation and an important feature in the program for the beautification of Queens. The club-house consisted of a two-story Colonial structure with locker accommodations for 300, as well as a dining room, a lounge, baths and showers, a caddie room, and a professional's shop. The 6,480-yard course with its broad, rolling fairways was compared favorably by the press of the day with the better courses of Long Island. It is estimated to have cost $300,000.

Even the construction of this golf course was not sufficient to immunize the company from further legal action. Two months after opening it to the public, they were again in the courts on the same complaints by civic organizations, only this time these organizations were able to interest the District Attorney in the case. The case dragged along until June, 1932, when a decision was handed down in favor of the company. On January 1, 1934, the city decided to purchase the Corona property and the company's incinerators and garbage removal equipment for $4,457,364. The company's 500 employees were taken into civil service. So ended a business venture that not only solved Brooklyn's refuse problems for 26 years but also reclaimed 320 acres of meadow swamp land.

The Transformation

At the time that the property was acquired by the city and turned over to the Department of Parks, the golf course was doomed, for the Grand Central Parkway Extension, then under construction, cut a swath 600 feet wide through it.

All the irrigation and drainage pipe, together with the water tower and pumping system, were salvaged and forty acres of sod were reclaimed. Some was used in the Central Park Zoo, and the remainder throughout the parks in the five boroughs. The club-house now serves as field headquarters for the engineers in charge of the grading and other construction under the direction of the Department of Parks.

While the Corona Dumps will form a part of the coming World's Fair, many other ambitious plans had been proposed for its use. One scheme converted it into a new railroad center to speed up passenger service to the West. If the era of million-dollar fights had continued, a $4,000,000 arena would have been erected there. It was also considered for an aviation field and for a dirt track speedway.

The 90-foot mountain is now a thing of the past, and the pillars of smoke by day and night are fast being forgotten. Soon, not even one old familiar odor nor any of the ubiquitous discarded kitchen utensils will remain to remind the visitor of the old dump. Rising from this bed of refuse, the newest and most modern park in the city is rapidly taking form.

ACKNOWLEDGMENT.—The text of this article and the illustrations are reproduced through the courtesy of the Department of Parks, City of New York.

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COMPLETE MODEL OF COMMUNITY CENTER WITH PROPOSED MURALS FOR DECORATION

Leisure and the Community Center

By CYNTHIA WENTWORTH

LEISURE is the big enigma of tomorrow. It will be an asset or a liability according to the provision for its use. So far we have patiently allowed the industrial revolution to exert its most dire effects upon humanity and have failed miserably to plan to take adequate advantage of its greatest compensation, the growth of leisure time. In the early days of craft work when there was little specialization or mechanization, a man was accustomed to work from dawn to dark, for production was slow and a great deal of time had to be expended in providing for the most elementary needs. Leisure time was scarce, but this little was often gaily and wisely spent. There was an integrated community life in the villages of that day in which those of every age and station participated. But now the picture of a group of houses, large and small, existing side by side and circling the village green where common festivals were joined by rich and poor alike, has disappeared. Instead, here is the too typical picture:

We see endless rows of bleak houses huddled under a blanket of soot and smoke. Here dwells the segregated class of an industrial nation. The father goes to a factory, for eight hours instead of twelve, but he spends those hours on some small mechanical job which can have no meaning to him in terms of satisfaction in the finished product. He then comes home for a free evening. His home, wedged into a solid block, consists of approximately 900 square feet of living area minus the space occupied by the Victorian or Grand Rapids furniture. He hardly knows his neighbors, nor does he know any club or community center where he can rub elbows with them and get acquainted. His children have no place in which to play, and they are screaming about the house until one's ears might burst.

Movies are one of the few ways of his entertainment. There is probably somewhere a Y. M. C. A. or a Y. W. C. A. providing a swimming pool, a reading room, or a dance floor. But it is probably far away down town. On Saturdays or Sundays he may take in a football or baseball game; in any case he cannot endure staying at home for any length of time.

Doorsteps and traffic-filled streets are the places where he meets his friends after work. There is nothing that binds him to his neighborhood but a certain tired sentimental attachment which must fill him with resentment when he realizes that it is these surroundings which kill his much-advertised family life and which make futile any efforts on his part toward any form of community life.

The only way we can reanimate this shapeless community life of much of present-day America is by the establishment of integrated neighborhoods around the cells of community centers. We must meet the problem of utilizing to the utmost our most important asset, leisure, in the interest of saving the family and sustaining society. People must be given every opportunity to gather together in the common enjoyment of common interests. Today we are becoming more and more aware of the necessity of providing adequate housing for working-class families.

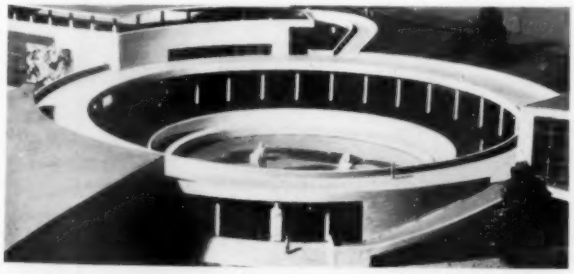
It is indeed a crying need, but if it is provided without proper emphasis on community integration, it will fail to give the families housed the new hold on life for which they seek and suffer. The greatest purpose of a housing program, the rehabilitation of family life, will be but partially achieved if we do not realize the importance of providing sufficient community facilities before it is too late. Because of the financial limitations of the PWA Housing Division, it should be pointed out that the few housing projects which are being built today are not on a large enough scale to make an economical unit for community recreation, although it is important that they have community facilities for the sake of their own success. The problem should be studied on a larger scale. A workable unit would be around 50,000 inhabitants; for each such unit in the country there should be an integrated community center.

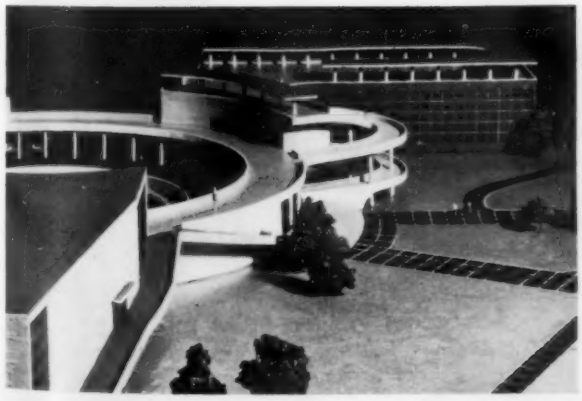
What are the elements of such a community center? They spring from the natural desires of the populace. People like to hear and see things—drama, movies, music and lectures. Therefore we conclude that an auditorium is necessary. People like to read, think, experiment, do things with their hands, requiring a second building designed for these functions. People like to swim and to play active games, necessitating a sports building. Still there are those who are seeking quiet enjoyment, and for them there should be gardens and shaded walks and benches. There should be playgrounds for little tots and a nursery school building. Finally, the elements should be united by an arrangement for pleasant circulation.

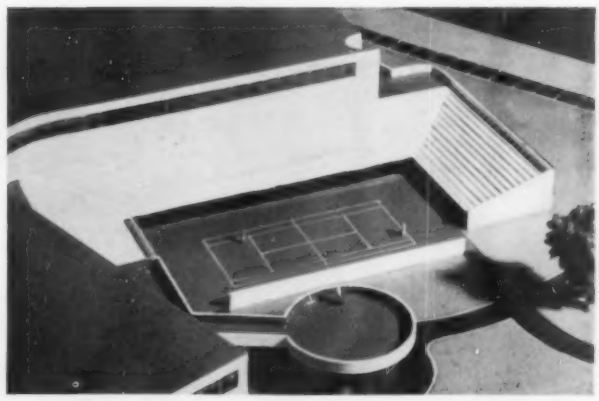
The Architects, Painters and Sculptors Collaborative of New York City has proposed the erection of a community center at the 1939 World's Fair along the lines of the design by Oscar Stonorov pictured on these pages. In the center is an outdoor swimming pool with diving-islands of sculpture. In the winter this pool could be used as a skating rink. Surrounding the pool is a muraled colonnade which provides for convenient circulation between buildings. The more or less rectangular building is the auditorium planned to seat 2,000. The L-shaped building includes a library, scientific laboratories, art galleries and workshops. The V-shaped building houses an indoor swimming pool, a gymnasium, locker rooms and a cafeteria. An outdoor arena for exhibition tennis is attached. Ramps and promenades connect the buildings, and the roofs might be used as sundecks. A nursery is located on the grounds.

The area needed for the buildings is about 8 acres. Adjoining should rightly be a large recreation field marked off for football, baseball, tennis and many other games. The project, exclusive of the athletic field, is estimated to cost around $800,000 with equipment. In a town of 50,000 persons this would mean $16 per head in taxes. What a small expenditure this would be spread over a period of years on one of the soundest possible investments a community could make! Today our hospitals are overloaded with physical and mental cases, many of which are undoubtedly the product of necessarily unbalanced living on the average working-class budget. Why not take one of the biggest steps toward saving these wasted human lives by giving everyone an opportunity for normal and healthful recreational expression? Under our present mode of shut-in tenement-house or row-house living, we are allowing much creative ability and much human happiness to be destroyed. What could be a finer achievement for society than to preserve and nourish these values?

A great shame of the American community is the lack of adequate recreational facilities. It is the challenge of today and tomorrow. A model project such as that described should certainly be part of "The World of Tomorrow" in the New York World's Fair of 1939 as an inspiration to its 50 million visitors. It should help point the way to a better use of leisure time for America.







Photographs by Bernard Hoffman; courtesy of The Architectural Forum

DETAILS OF SWIMMING POOL, COLONNADE, ARTS AND CRAFTS BUILDING AND TENNIS ARENA

At 16 Minutes a Mile

Cletracs keep clean the sidewalks of this New England village

Going along at four miles an hour, this Cletrac rapidly cleans the sidewalks of this New England City.

Scraping clean all the way and taking off all the snow, no matter how deep or well packed down, the Cletrac gave this town real snow removal service.

Throughout New England . . . in New York, Pennsylvania, New Jersey . . . in Ohio, Indiana, and Illinois . . . in Michigan, Wisconsin, Minnesota . . . throughout the entire snow belt Cletracs are doing a better job of snow removal at lower costs.

There's a Cletrac for every snow removal job from cleaning sidewalks to opening up drifts many feet deep. And it's on these snow removal jobs that you appreciate the easy maneuverability . . . the rugged construction . . . the positive traction of the Cletrac . . . its ability to get through any kind of snow—light, powdery snow; heavy, wet snow; hard, packed snow.

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Electric-Starting on Diesels

All Cletrac Diesels have now and always have had ELECTRIC Starting . . . modern starting.

The advantages are many: less time consumed in getting on the job in the morning . . . less idling time . . . only one engine to maintain . . . current available for electric lights . . . no secondary engine to be cranked.

Choose the tractor with modern starting. It is just one of the many PLUS Values you'll find in a Cletrac.

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The only tractors with controlled differential steering that keeps both tracks pulling at all times . . . on the turn as well as on the straightaway.

Costs of Pumping Water Compared

Rock Island, Ill., Converted a Hand-Fired Steam Plant to Electric-Driven Pumping with Beneficial Results

By D. R. MARTIN
Westinghouse Electric & Manufacturing Company

FIRE protection, insurance rates, health and taxes are all major points for consideration when changes are to be made in a city's water supply. Hence, when the National Board of Fire Underwriters notified the city of Rock Island that repairs and improvements would be necessary in the boiler room and to the steam-driven pumps, the Council enlisted the aid of the Federal Engineering Co., of Davenport, Iowa, to make a complete study of the water pumping plant.

Installed at that time were two steam-engine-driven pumps, one about 20 and the other about 25 years old; also, a smaller, high-speed pump driven by a turbine through a gear reducer. There was an earnest desire to effect economies in the cost of pumping water. Three methods were studied to bring about the reduction in cost: one was to improve the boiler-room operation without increased investment; the other methods, effecting greater economies, involved additional investment in equipment.

A brief study of the boiler-room conditions was made. Several samples were taken of CO_2 at frequent intervals, during the test on the pumping unit. These averaged 8.66 per cent over a two-hour period and ranged from 4 to 12 per cent. This and other boiler-room conditions indicated that a minimum annual saving of 5 per cent in coal could be made without any investment in new equipment. This would approximate $475 to $500 a year savings.

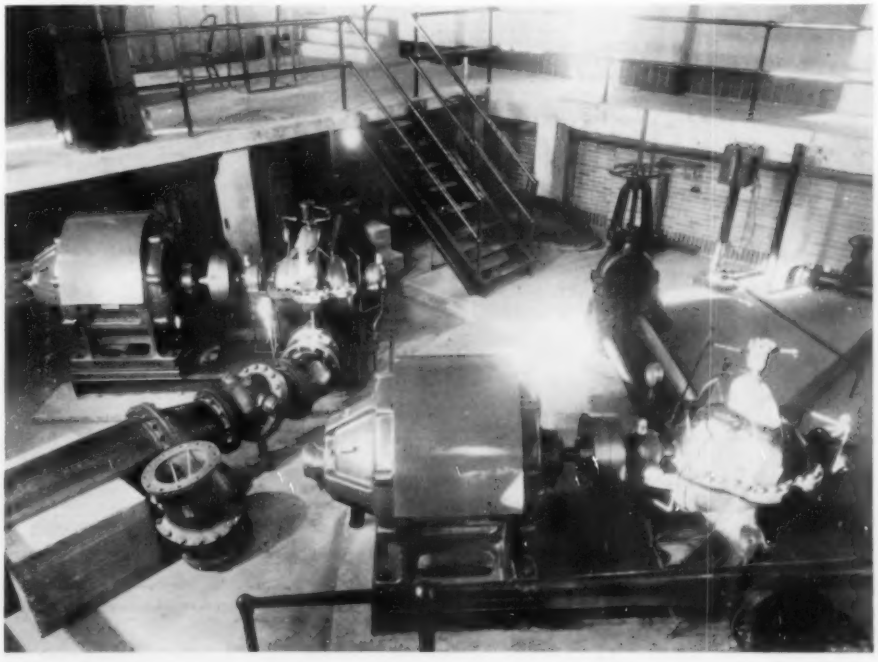
Other methods of using fuel, such as natural gas, fuel oil, pulverized coal and stoker operation, were considered,

COMPARATIVE COSTS BASED ON AVERAGE YEARS
1927-1928-1929-1930-1931-1932

Plant Accounts	Hand-Fired	Stoker-Fired	Electric-Drive
Average tons coal, 2,540			
Average price per ton, $3.94			
Cost of coal-total	$10,009.87		
Deduct 200 tons for incinerator at average price of $3.94 per ton			
Total cost incinerator coal	788.00		
Coal cost to water works	$9,221.87		
Stoker coal, 2,105 tons (10% increased efficiency at $3.00 ton)			
Total cost stoker coal		$6,318.00	
Electricity		300.00	$10,817.75
Superintendence	1,158.33	1,158.33	1,158.33
Engineers	6,827.58	6,827.58	4,600.00
Firemen	4,500.00	4,500.00	
Boiler supplies (average)	198.51	198.51	
Boiler and stoker repairs (average)	368.00	500.00	
Miscellaneous labor	2,383.90	2,383.90	2,383.90
Unloading coal	400.00	350.00	25.00
Miscellaneous supplies	854.62	854.62	500.00
Lubricating oil (estimated)	250.00	250.00	25.00
Heating building			200.00
Interest at 6% on capital investment		300.00	660.00
	$26,162.81	$23,940.94	$20,369.98

basing the proposed savings, not on the existing [redacted]-room conditions, but on improved boiler-room [redacted]ns. Several stoker propositions were considered, and all showed that savings of about 10 per cent above improved hand firing could be made.

The use of central station electric current was also considered. Three sets of figures were set up: one showing



A VIEW OF THE WORTHINGTON ELECTRIC-DRIVEN PUMPS IN THE ROCK ISLAND, ILL., WATER WORKS

FLUSHING!

Removes Flying Dust!

• Every city can have clean, sanitary streets . . . at lowest possible cost . . . by "washing all the dirt away" with modern, motorized street FLUSHERS. Not only the heavy debris, but the gigantic accumulation of "fine dust" that "blows and swirls" . . . that raises havoc with pedestrians, endangers traffic, sifts into stores, offices and windows . . . and makes life miserable for housewives in homes. FLUSHERS wash streets "Spotlessly clean," removing ALL the dirt. Also flushers clean UNDER PARKED AUTOMOBILES (a big problem by any other street-cleaning method). Investigate NOW. Write Municipal Supply Company, South Bend, Indiana, for complete information regarding "South Bend" Flushers.

South Bend

When you write for that catalog, kindly mention THE AMERICAN CITY.

ESTIMATED ANNUAL SAVINGS

Savings Before Depreciation Deduction		
Stoker over hand-fired	$2,221.87	
Electric pump over hand-fired		$5,792.83
Depreciation at 5% on capital investment	$250.00	$550.00
Saving after Depreciation Deduction		
Stoker installation—30 months or 2 years and 6 months		
Electric pump over hand-fired		$5,242.83
Years to Pay for Investment		
Stoker installation—30 months or 2 years and 6 months		
Electric-drive installation—25 months or 2 years and 1 month		

the boiler room as then operated; a second, based on stoker-fired conditions, using $1.00 a ton cheaper coal and a consumption of 90 per cent of the hand-fired amount through 10 per cent increased efficiency; the third, electric power on an off-peak schedule of pumping at off-peak rates.

The average annual saving that would have resulted from electric-driven pumps from 1927 to 1932, inclusive, amounts to $5,243.83 per year, or a total of $31,456.98 for the six years. The savings that might have been expected from stoker installation averaged $1,971.87 per year, or a total of $11,831.22. A direct comparison of the two savings shows the electric drive would have saved 2.66 times that of a stoker installation.

As this was an average covering a six-year period of operation, it was agreed that it represented a reliable comparison of the two proposed projects and resulted in a decided advantage in favor of electric-driven equipment.

On the basis of these findings, it was decided to install two 10-mgd centrifugal pumps, to be driven by 500-hp, slip-ring motors. This equipment, with the necessary primary and secondary control, foundations, piping changes and installation charges, required an investment on the part of the city of about $20,000.

The city's fire-protection facilities are now adequate, insurance rates will not go up—may go down. The quality of the water is better, owing to the longer settling periods now possible. The saving of $5,242.83 per year will continue to have a pleasing effect on the taxpayers' purse for years to come.

Premature Subdivision and Tax Arrears

INSTEAD of permitting the incipient boom in urban and suburban real estate, now observable in many parts of the United States, to get entirely out of hand, city and county officials would do well to ponder the lessons to be learned from the recent era of excessive subdividing and disastrous tax delinquency.

Significant figures bearing on this problem in New York State and in Michigan have been released in recent weeks. The New York information comes from the State Planning Council of New York, of which Wayne D. Heydecker is director. The survey was directed and the reports prepared by Philip H. Cornick of the Institute of Public Administration, and are said by Mark Graves, State Commissioner of Taxation and Finance, to be "unique in the country and in this field the most valuable contribution made in a long time to the information of state officials."

Complete data on tax arrears are presented for Rochester, Syracuse, 25 towns in Erie County, 4 towns in Monroe County, and all of Westchester County except White Plains. For these areas the total number of taxable parcels is 529,993, of which 237,092 are improved and 292,901 vacant land. The number of properties in arrears is 197,463. Of these 34,451 are improved and 162,772 are parcels of vacant land. The total arrears are $34,567,307, of which the vacant lands are responsible for 67.6 per cent. It thus appears that 14.63 per cent of all the improved parcels are in arrears and that 55.57 of all the vacant parcels are in the same unfortunate state.

In the 62 towns of three metropolitan counties—Erie, Monroe and Westchester—47.4 per cent of all the vacant lots are concentrated in those portions of 13 suburban towns which lie outside villages; and 87.3 per cent of all the special district debts of towns in those counties rest on the unincorporated areas of the same 13 selected towns. In these counties the study offers direct evidence of the effect of premature subdivision on cost of government.

Citing the case of an unneeded subdivision containing 3,734 lots placed on the market in 1935, the report calls attention to the fact that "the activity which has been observed throughout the report does not belong in the realm of ancient history. It is something which is now going on and will continue to go on until an aroused public opinion, remedial legislation and improved administration bring it within control."

"There is a simple but inescapable fact in plane geometry which comes into play to undermine the boom in subdivision development around cities," says the Council. "If a city is circular in shape, and its built-up areas extend one mile in every direction from the center, it will be necessary to push out the boundaries of the built-up section only about four-tenths of a mile in order to double the size of the city. In other words, the increase of the city's diameter from 2 miles to roughly 2.8 miles will be sufficient to double its area. If the subdividers in their enthusiasm push out the boundaries as much as one mile in every direction—and one mile in these days of automobiles and hard surfaced highways is an almost negligible distance—the original area of a city will, after the addition of its newly subdivided fringe, have been multiplied by four. Unless the growth of population had meanwhile been phenomenal, premature subdivision will have become a fact, the supply of vacant lots will have outrun both the effective demand and the speculative demand predicted on resale at a profit."

Effects of Uncontrolled Subdivision of Land in Suburban Areas in Michigan

Results of a study of the extent of excess subdividing of suburban land in Michigan and its effect on public finance are disclosed in a report on Suburban Subdivision Development, recently issued by the Lansing office of the State Planning Commission.

Here are some highlights of this survey as related to two townships of metropolitan Detroit:

In *Redford Township* it was found that of 27,183 lots platted and recorded, only 1,179 have been utilized.

20-foot business lots were prepared in a ratio of one to every two residential lots. These have been utilized in a ratio of one to every ten residential lots.

60.5% of vacant platted property is delinquent on taxes for "1932 and prior years" and all subsequent years.

7.3% of utilized residential property is delinquent to the same degree.

A similar study of *Taylor Township* shows 25,767 lots platted and recorded and only 368 utilized.

37.3% of all platted lots were 20-foot business lots. These have been utilized in the ratio of one to every five residential lots.

66.5% of vacant platted property is delinquent on taxes for "1932 and prior years" and for all subsequent years.

6.8% of utilized residential property is delinquent to the same degree.

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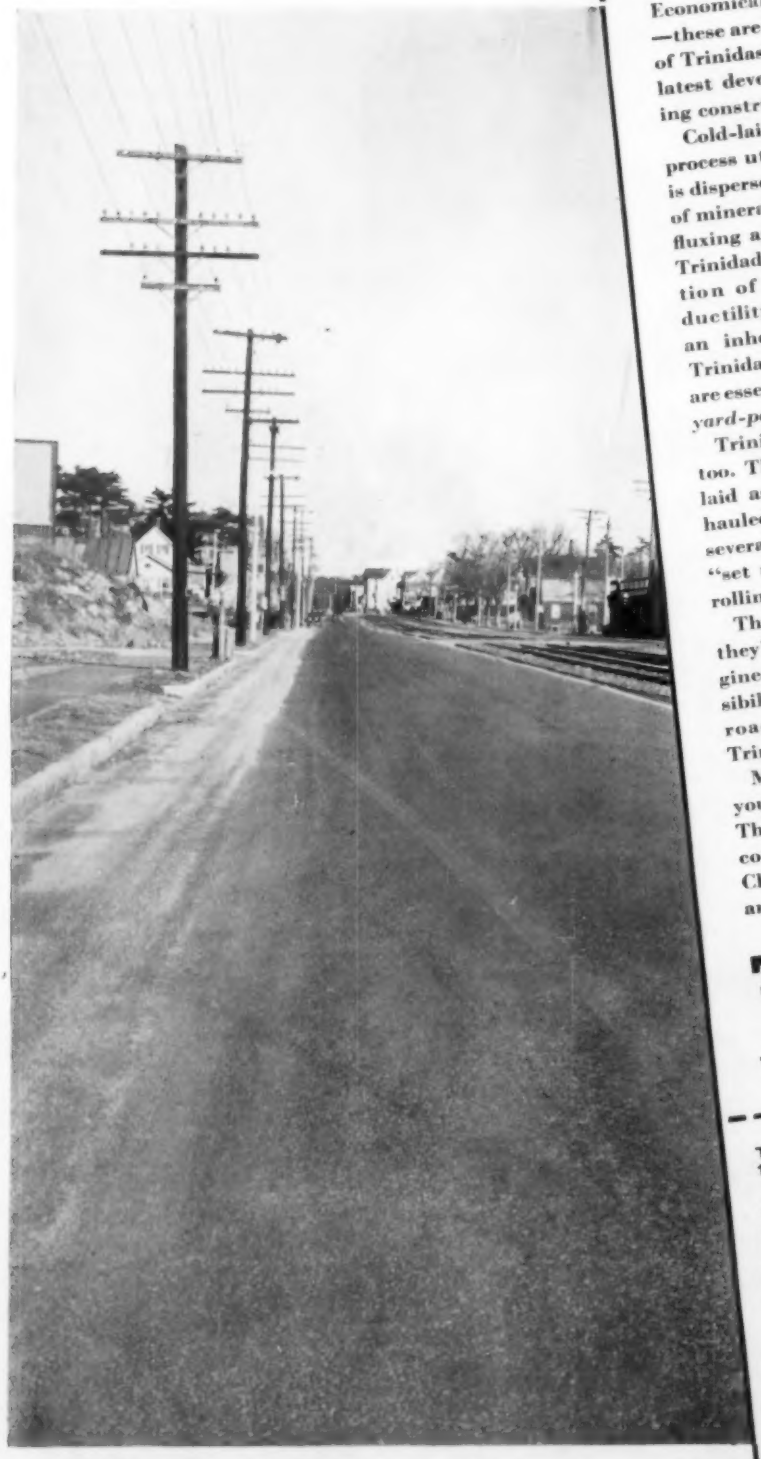

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Gas from Sewage Sludge

Heat Supply and Requirements for Separate Sludge Digestion Tanks in Relation to Connected Population

By EDWARD W. MOORE
Harvard Graduate School of Engineering

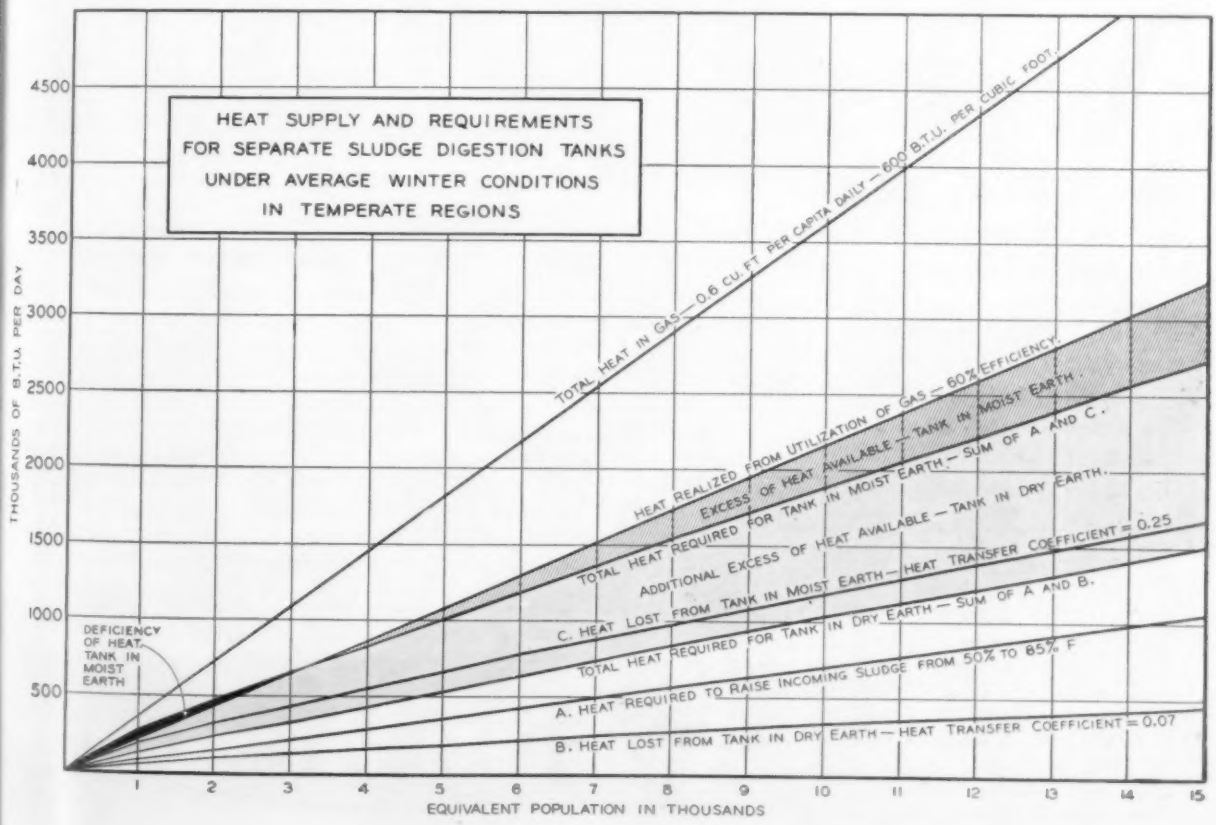
THE use of sludge gas as a source of heat for separate sludge digestion tanks is an established practice in modern sewage plants, since winter temperatures in the northern latitudes of the United States are too low to permit digestion to proceed at a reasonably rapid rate. The gas produced during digestion may also be used for many other purposes, but this can be done only if the available gas will furnish more heat than is required to keep the tanks in the temperature range most favorable to digestion. Other conditions being equal, the relationship between the available heat and the heat required by the tank will depend on the population connected to the plant, including the population equivalent of organic trade wastes. This relationship may be termed the heat balance of the tank. The heat balance may be computed for any individual case, and it is of interest to determine how it will vary in general with population under a given set of conditions. The accompanying diagram shows the heat balance to be expected under conditions representative of the winter period in the temperature regions of the United States, for tanks buried in dry and in wet soil. The method of determining the heat balance, and the significance of the results obtained, are discussed in this paper.

Basic Data

The basic data utilized in the computation of the heat balances have been derived from various sources in sewage literature, and are believed to represent the best average figures obtainable. They are here set forth in tabular form:

Gas produced	0.6-cubic foot per capita per day
Fuel value of gas	600 Btu per cubic foot
Efficiency of utilization of heat in gas	60 per cent
Wet sludge (95 per cent moisture)	2 pounds per capita per day
Specific heat of sludge	1
Temperature of incoming sludge	50° F.
Temperature of sludge in tank	85° F.
Mean temperature of tank environment	40° F.
Volume of tank	1.5 cubic feet per capita
Height of tank	10 feet

The tank is assumed to be of concrete construction, cylindrical in shape, and covered with earth except for the top.


HEAT SUPPLY AND REQUIREMENTS FOR SEPARATE SLUDGE DIGESTION TANKS UNDER AVERAGE WINTER CONDITIONS IN TEMPERATE REGIONS
THOUSANDS OF B.T.U. PER DAY
4500
4000
3500
3000
2500
2000
1500
1000
500
TOTAL HEAT IN GAS — 0.6 CU. FT. PER CAPITA DAILY — 600 B.T.U. PER CUBIC FOOT
HEAT REALIZED FROM UTILIZATION OF GAS — 60% EFFICIENCY
EXCESS OF HEAT AVAILABLE — TANK IN MOIST EARTH
TOTAL HEAT REQUIRED FOR TANK IN MOIST EARTH — SUM OF A AND C.
ADDITIONAL EXCESS OF HEAT AVAILABLE — TANK IN DRY EARTH.
C. HEAT LOST FROM TANK IN MOIST EARTH — HEAT TRANSFER COEFFICIENT = 0.25
TOTAL HEAT REQUIRED FOR TANK IN DRY EARTH — SUM OF A AND B.
A. HEAT REQUIRED TO RAISE INCOMING SLUDGE FROM 50° TO 85° F
B. HEAT LOST FROM TANK IN DRY EARTH — HEAT TRANSFER COEFFICIENT = 0.07
DEFICIENCY OF HEAT, TANK IN MOIST EARTH
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
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Diesel or Gasoline
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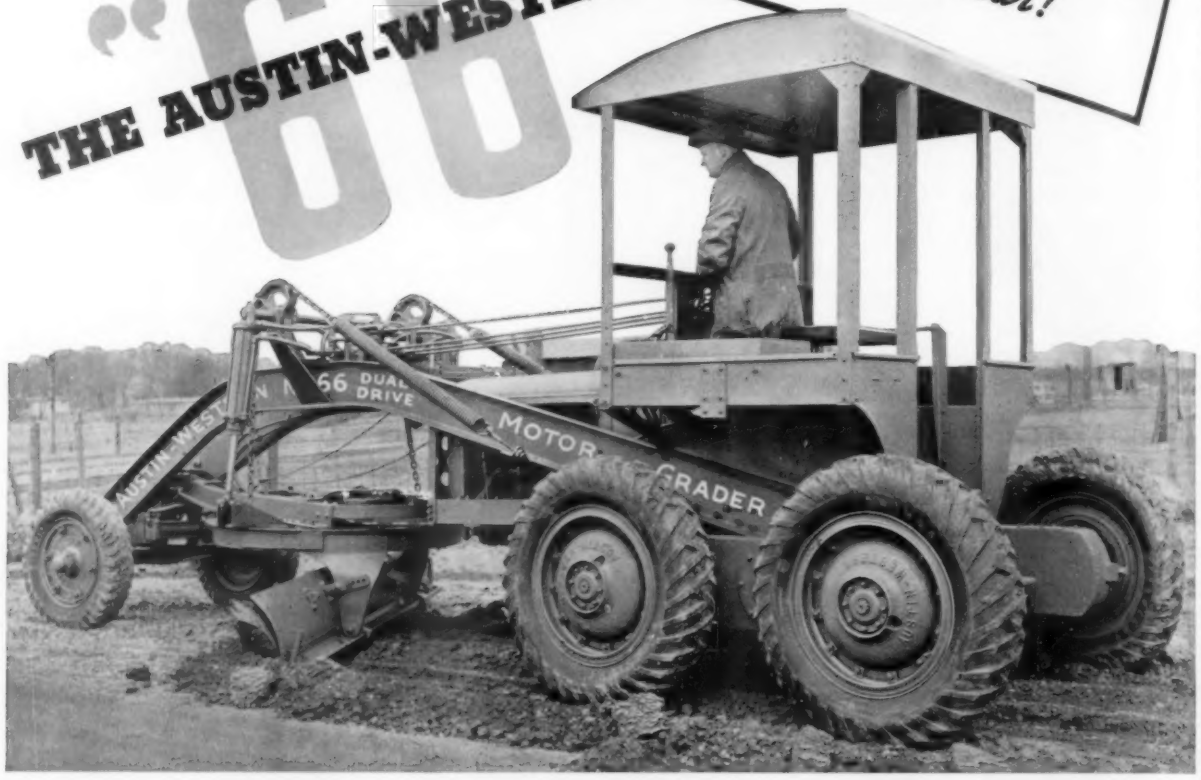

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● The Austin-Western "66" sets a new standard for light motor grader performance and economy. Powered by the Buda-Lanova Diesel or the International Harvester Gasoline Motor, it starts exactly like your car—no getting out for adjustments after warm up.

The "66" motor grader is especially designed for economical highway maintenance and light construction work. The new exclusive "AWCO" transmission provides speeds for all motor grader jobs, assuring outstanding performance at economical engine R. P. M.

In addition to the new features listed at left, the "66" has standard A-W full hydraulic controls with power steer, anti-chatter blade, and correct weight distribution. These outstanding features give the "66" most of the operating advantages of a heavy duty machine at lowest cost. Find out how this "66" can outperform on your road building and maintenance jobs, winter or summer.

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Austin-Western

Heat Lost by Conduction and Radiation

In a previous paper[1] the author showed that the heat lost from a digestion tank depends primarily on the total surface area of the tank and the temperature difference between the sludge in the tank and the environment of the tank. The rate at which heat is lost from the tank may be expressed in terms of an average heat transfer coefficient, the units of which are Btu lost per hour through a square foot of tank surface, for 1° F. temperature difference between the sludge and the tank environment. On the basis of two practical studies of heat losses in digestion tanks, those of Rudolfs and Miles[2] and Young and Phillips[3], the values of this coefficient are found to be 0.07 for a tank in dry earth, and 0.25 for a tank in very moist earth. This represents the extreme range of variation so far observed in practical studies.

Computation of Heat Balance

If P represents the equivalent connected population in thousands, then

Total heat in gas, in Btu per day = 360,000 P

Total heat realized from gas in Btu per day = $0.6 \times 360{,}000$ P

These two equations are represented by straight lines on the accompanying diagram. The heat required to raise the daily additions of sludge to the temperature of the tank is, in Btu per day,

$$2 \times 1{,}000 \times 1 \times P \ (85\text{-}50) = 70{,}000 \ P$$

This is line A on the diagram.

For the assumptions made regarding the shape, depth, and per capita volume of the tank, it can be shown mathematically that the total surface area of the tank in square feet is

$$300 \ P + 435 \sqrt{P}$$

The first term represents the area of the top and bottom of the tank, the second that of the sides. The heat lost per day from the tank, in Btu, may then be computed in the following manner:

Heat lost from tank in dry earth = $(300 \ P + 435 \sqrt{P}) \times 0.07 \times 24 \times (85\text{-}40) = 22{,}700 \ P + 32{,}900 \sqrt{P}$

Heat lost from tank in moist earth = $(300 \ P + 435 \sqrt{P}) \times 0.25 \times 24 \ (85\text{-}40) = 81{,}000 \ P + 117{,}500 \sqrt{P}$

These equations are represented by lines B and C, respectively, on the diagram.

The total heat required for the tank in dry earth is the sum of the ordinates of lines A and B, and that for the tank in moist earth is the sum of the ordinates of A and C. The values of these two sums are plotted on the diagram as total heat required, and may be compared with the available net heat. It will be noted that the available heat is in all cases greater than the heat required for a tank placed in dry earth. In the case of the tank surrounded by moist earth, the heat supply is inadequate until the connected equivalent population is slightly more than 3,000 and no large excess of heat is available until the population is over 6,000. The great difference between the heat required under the two conditions is worthy of note, and is due to the fact that moist soil is a much better conductor of heat than dry soil. The author believes that the diagram is self-explanatory and requires no further discussion. It should be noted that different basic conditions than those assumed by the author—i.e., gas production, outside temperatures, etc.—would produce different curves, and thus materially alter the values of heat excess or deficiency obtained. However, the diagram is believed to furnish a good approximation of the results to be expected under average conditions. Published accounts of plant operation seem to indicate that the useful heat derived from a gas-engine equipped to transfer its waste heat to the tank is nearly the same as that assumed in the case of a direct heating system—namely, about 60 per cent of the total fuel value of the gas. The heat balance therefore remains about the same whether the gas is used to produce power or burned directly under a boiler.

[1] Moore, *Sewage Works Journal*, 7, 618 (1935).
[2] Rudolfs and Miles, Ibid. 5, 855 (1933).
[3] Young and Phillips, Ibid. 7, 96 (1935).

Activated Carbon in Sludge Digestion

FOLLOWING a series of laboratory experiments and full plant experiments at Ithaca, N. Y., Prof. C. L. Walker, Department of Sanitary Engineering, Cornell University, recently reported on the effect of activated carbon in sewage sludge digestion in a paper presented before the New York State Sewage Works Association. Since the sewage of Ithaca is primarily a domestic sewage, he feels that such tests as were made would generally apply to average domestic sewages.

The conclusions drawn are:

1. The addition of activated carbon to fresh sludge reduces odor.

2. While the evidence is conflicting, the use of 5 to 15 ppm of carbon in sludge digestion at 20 degrees Centigrade, appears to yield more gas than is produced when no carbon is used; at 28 degrees Centigrade this same advantage does not appear. When added to the sludge in greater amounts, the carbon appears to reduce the amount of gas produced at all temperatures.

3. At 20 degrees Centigrade the presence of carbon in the sludge resulted in completed digestion earlier than when no carbon was used. At 28 degrees and 45 degrees Centigrade no advantage in this respect was shown.

4. The evidence indicates that the addition of activated carbon to sludge increases the methane content of the gas produced.

5. The addition of activated carbon to sludge increases the drainability of the sludge, the maximum influence in shortening the time of draining occurring when carbon is used at 30 ppm.

6. Little or no change in the hydrogen ion concentration of digested sludge due to the amount of carbon was noted.

7. When used in small amounts, less than 5 ppm, an increase in the temperature of the sludge was noted after adding carbon.

Sewage-Works Financing in Illinois

OF the 49 sewage-treatment projects carried out in the past two years in Illinois, 23 were financed under the sewerage revenue bond plan and 8 others by combined water and sewerage revenue bonds. This popular usage of the revenue or "rental" forms of financing is interesting considering the fact that they have been available in Illinois only since 1934.

These types of financing differ from special assessment and general obligations bonds in that the revenue bonds are retired by "rental" charges against the users of the sewer system, the amount of the charge being based on water consumption or number and type of fixtures in most cases. The rentals are sufficient to retire the bonds, pay interest, cover operation cost, and establish a depreciation fund.

—From a report of the Illinois Department of Public Health, published in *The Digester*.

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Cities Find This Unit Ideal For Loading Out Stockpiles

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New Development of Diesel Power Burns Gas on True Diesel Cycle

By W. H. RODGERS
City Manager, Lubbock, Texas

NINE MONTHS OPERATING RECORD

Date 1936-37	K.W. Hours Generated	Gas Used 1000 Cu. Ft.	Gas Cu. Ft. Per K.W. Hr.	Cost of Fuel: Gas	Cost of Fuel: Pilot Oil	Cost of Fuel: Total	Fuel Cost Per K.W. Hr.	Gals. Lub. Oil Used	Engine H.P. Hrs. Per Gallon	No. of Hrs. Run	No. Hrs. In Month	% Hrs. On Line
Sept.	535,700	5,813	10.88	$831.50	$133.36	$964.86	$.00180	216	4,920	708	720	98.25
Oct.	553,600	6,101	11.02	844.54	139.68	984.22	.00178	192	5,780	742	744	99.75
Nov.	528,100	5,831	11.03	803.50	135.24	938.74	.00178	186	5,790	718	720	99.75
Dec.	560,800	6,277	11.20	816.01	139.20	955.21	.00171	193	5,740	739	744	99.50
Jan.	535,700	5,912	11.03	768.56	134.10	902.66	.00169	186	5,750	713	744	96.0
Feb.	503,200	5,383	10.70	699.79	125.45	825.24	.00164	179	5,580	666	672	99.5
March	560,600	6,122	10.92	795.86	139.20	935.06	.00167	211	5,250	739	744	99.5
April	547,800	6,175	11.38	802.75	134.80	937.55	.00172	198	5,420	715	720	99.5
May	560,900	6,321	11.29	821.73	136.00	957.73	.00171	212	5,120	722	744	97.0
TOTAL	4,886,400	53,935	11.05 average	$7,184.24	$1,217.03	$8,401.27	$.00172 average	1,773	5,483 average	6,462	6,552	98.6 average

Total K.W. Hrs. Generated	4,886,400	B.T.U. Content of Pilot Oil	19,200 per Pound.
Total Cu. Ft. Gas Consumed	53,935,000	Cost of Gas	13 to 14 Cents per 1000 Cu. Ft.
Average Cu. Ft. Gas per K.W. Hr.	11.05	Cost of pilot Oil	4 Cents per Gallon.
B.T.U. Content of Gas	975 per Cu. Ft.	Total B.T.U's. per K.W. Hr. Generated	11,670

REPORT FROM THE NATURAL GAS DIESEL PLANT AT LUBBOCK, TEXAS

THE Lubbock, Texas, municipal plant operates six diesel engines of 720 to 1,665 hp and aggregating 6,480 hp to carry a peak load of 3,000 kw. Our most recent and largest unit, installed in 1936, is a convertible Nordberg for operating on either oil or gas. This engine operates on natural gas and uses the full diesel principle.

A unique feature of this new engine is that it uses the same compression for either fuel, and there is no change in any of the major parts for operation on either. In operation, the cylinder is filled with pure air from the scavenging pump attached, and this air is compressed to 475 pounds per square inch, when gas is injected through the regular fuel injection valve, the same as with oil fuel. This is ignited through heat of compression, thus driving the piston.

Engine Compresses Gas

This engine is an 8-cylinder, 1,500-hp unit of the 2-cycle type, crosshead constructed. Being of the air-injection type, the engine is equipped with a three-stage air compressor; but instead of compressing air it compresses gas. When the engine is operating on natural gas, the regular fuel pumps for oil operation are used for opening the fuel needle valves. For this purpose, these fuel pumps pump lubricating oil instead of fuel oil up to the hydraulic actuators which are attached to the fuel valve rocker arms and which open the fuel needle valves long enough to permit the proper amount of gas to enter the cylinder.

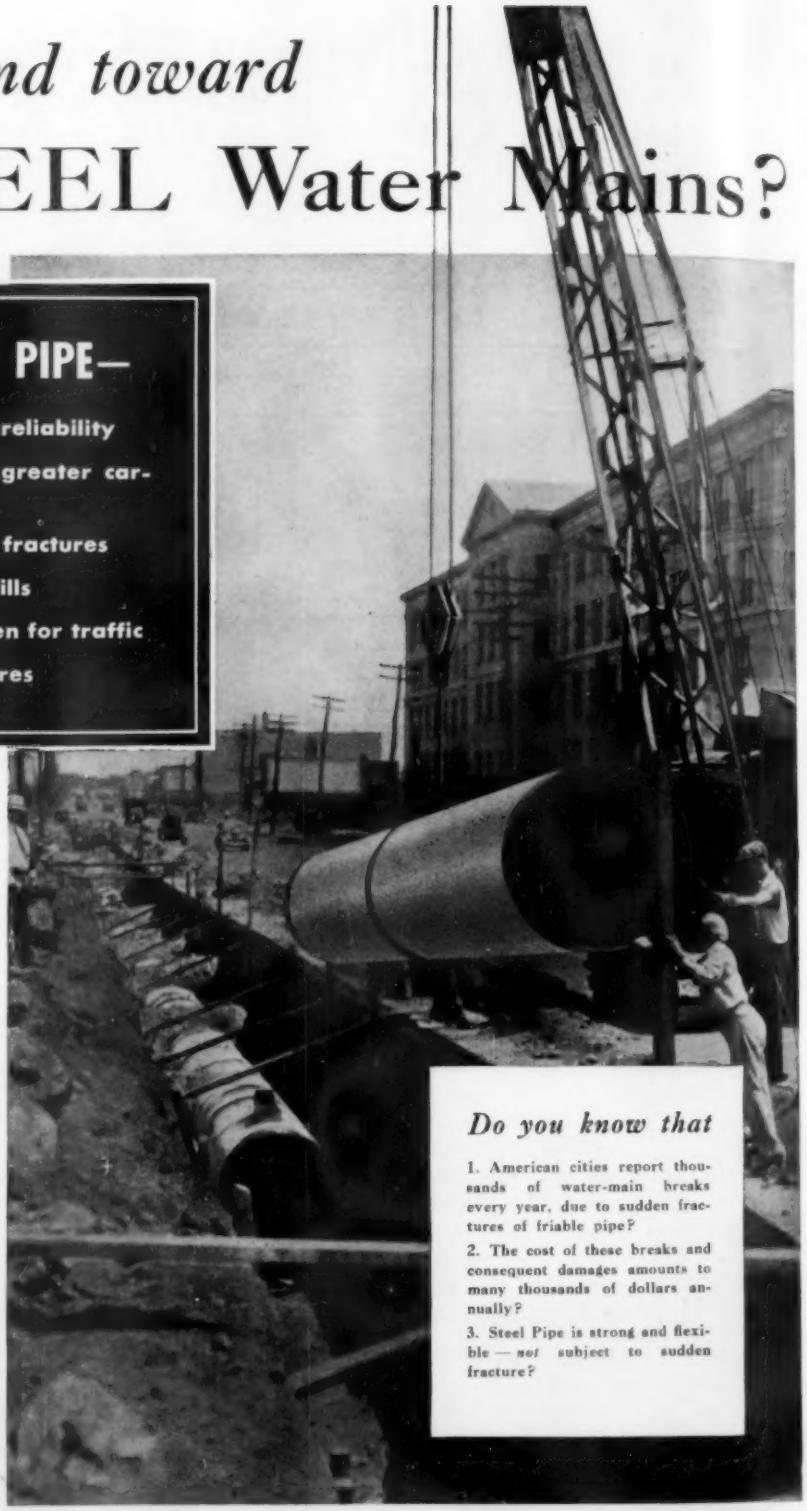
The tabulation gives the performance of this engine for nine months' operation, during which 4,886,400 kwh were produced by 53,935,000 cubic feet of gas and 34.86 pounds of pilot oil per hour at all loads. The average gas fuel cost amounted to $0.00172 per kwh, while with fuel oil as used by the other five diesels, at 3.1 cents per gallon, the cost is $0.0032 per kwh. This reduction of $0.00148 amounts to 46 per cent. In the event of an interruption of the gas supply, the engine can be converted to oil.

Plant Netted $147,926

The total production of the plant for the last fiscal year was 10,773,000 kwh. The city used 2,138,031 kwh and was charged $34,505, or 1.6 cents per kwh. Other sales totaled 6,699,683 at an average of 2.94 cents per kwh. The gross revenue was $231,764; operating expenses, $83,838; leaving an operating surplus of $147,926.

DUAL-FUEL DIESEL ENGINE OPERATING ON NATURAL GAS, IN THE LUBBOCK PLANT

Why the trend toward STEEL Water Mains?



Because STEEL PIPE—

1. Offers greater all-round reliability
2. Has low friction loss . . . greater carrying capacity
3. Eliminates risk of sudden fractures
4. Saves money on repair bills
5. Helps to keep streets open for traffic
6. Withstands higher pressures

THESE are the reasons why far-sighted city engineers are weighing more carefully the inherent advantages of steel pipe—and specifying National Steel Pipe—for underground water-main construction.

National Steel Pipe has proved beyond question that it has the reserve stamina to resist the strains that frequently cause damage to less reliable material. Engineers' reports from all sections of the country show that it stands up under the constant vibration of heavy street traffic and the stresses of trench pressures, cave-ins, settlements, washouts, and similar external forces.

In addition, the use of National Steel Pipe results in low maintenance costs. Its clean, smooth *in*terior means less friction and full flow capacity. Its clean, smooth *ex*terior is ideal for the application of special coatings needed if pipe is laid in severely corrosive soils.

Do you know that

1. American cities report thousands of water-main breaks every year, due to sudden fractures of friable pipe?
2. The cost of these breaks and consequent damages amounts to many thousands of dollars annually?
3. Steel Pipe is strong and flexible — *not* subject to sudden fracture?

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UNITED STATES STEEL

Two of Orange's Three Pumpers Are 1937

By MAURICE M. CALDWELL
Director, Department of Public Safety, Orange, N. J.

THE Fire Department of the city of Orange, N. J., 38,000 population, converted hand engines into horse-drawn in 1873; became part-paid in 1887 and full-paid in 1908; completely motorized in 1914; and on the two-platoon system in 1918.

At present there are 47 men: Chief Jeremiah Savage, 2 deputy chiefs, 6 captains, 38 privates. These form an aerial truck company, and three engine companies, two of which were organized this year. Four other pieces of apparatus can be used when necessary.

The value of taxable property in Orange is $26,317,850, while tax-exempt property is worth $11,277,500. The annual fire loss has averaged $36,604 for the last five years, compared with $65,070 prior to 1933. The Department averages 200 alarms per year.

That main artery of any fire department, the fire-alarm system, was placed in operation in Orange in 1887. Properly located through the 2.2 square miles of our city are 60 boxes. As the Department is housed in one building, response is prompt. The alarm system is operated by storage batteries that are charged daily and maintained at 38 volts. All wires are overhead.

The personnel of the Bureau of Fire Prevention, established in 1934 by former Director John M. Drabell, comprises a chief inspector, a captain and six firemen. This Bureau has an Advisory Board consisting of eight citizens. The job of the Bureau is to enforce ordinances and to recommend new ones covering:

1. Prevention of fires
2. Storage of explosives and inflammable materials
3. Installation and maintenance of equipment
4. Regulation of fire escapes and means of exit
5. Theater inspection
6. Causes of fires

Rescue Work

Each platoon has six men assigned for response to emergency calls, such as suicides, cats in trees, children locked in rooms, squirrels in attics. Not only these men, but all the men, are trained in the use of the inhalator and the Schaefer method of artificial respiration. Once each week every man receives training in the use of all types of equipment from rope and ladder work to the operation of pumper and aerial.

In January, 1937, two 750-gallon Seagrave pumping engines replaced a pair of combination hose and chemical machines. On test the new pumper delivered 1,473 gallons per minute at 130 pounds pressure at the pump.

Efficient Coal-Handling at Dover Plant

By L. D. SHANK
City Manager, Dover, Del.

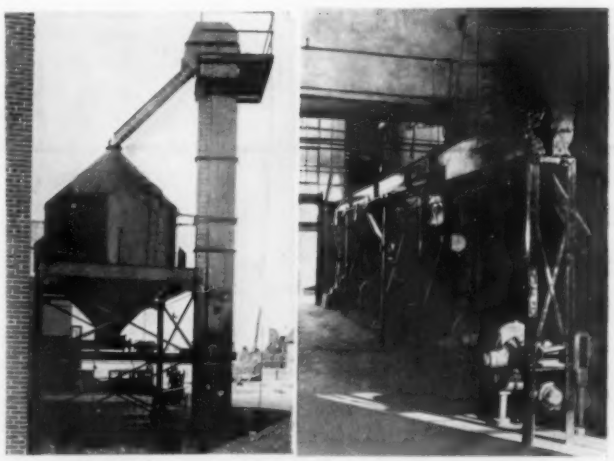
HOW much of a coal-handling system is one justified in installing for a boiler house burning 13 to 15 tons of coal per day, or, say, 4,000 to 5,000 tons per year?

Our municipal electric plant is situated ¾-mile from the railroad siding, and the coal was trucked to low charging cars and pushed inside the plant. We decided to stop double-handling even this modest tonnage. We have therefore installed a chain-and-bucket elevator that can handle 16 tons per hour. The coal discharges from the elevator into a 25-ton bin. The bin discharges directly to a screw conveyor feeding the stokers.

More and more are the smaller boiler-house plants giving consideration to the use of equipment that makes for greater efficiency. The municipal plant at Dover, Del., and the general appearance of the municipal and state buildings located there, reflect a forward and up-to-date scheme of planning, not only in general appearance but in their substantial character. The Link-Belt coal-handling equipment described is in line with this plan.

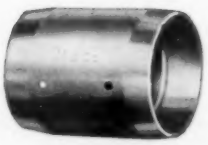
The plant is equipped with three turbo-generators: a 500-kw General Electric installed in 1925, and a 750-kw and a 1,250-kw Westinghouse in 1928 and 1932 respectively. Production in the last fiscal year totaled 3,657,000 kwh, of which 396,000 was used free by the municipality.

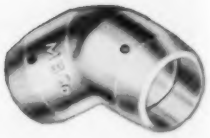
The total revenue was $138,054, or about 4½ cents per kwh. Domestic rates are 8 cents per kwh for the first 25 kwh, 6.2 cents for 100 kwh, 4.8 cents for 200 kwh. All expenses exclusive of the new coal-handling plant totaled $65,699, leaving a surplus of $72,355. The population of Dover is 4,800.



LEFT—ELEVATING THE COAL TO STORAGE BIN. RIGHT—LINK-BELT SCREW CONVEYOR DELIVERING COAL FROM BIN TO HOPPERS OF STOKERS

FOR CONSTANT FULL FLOWING AND LIFELONG SERVICE!





DURING the past seven years, Copper Service Pipe connected with STREAMLINE SOLDER FITTINGS has been installed in hundreds of communities throughout the United States and Canada, from corporation to curb stop and on into the building. We have never had a report where Solder Fittings failed or leaked in these installations.

STREAMLINE Fittings are not connected by threading or flaring the pipe, but by an entirely new and revolutionary method that utilizes nature's law, capillary attraction, to form one of the tightest and strongest joints known to the trade.

A service line of Type K Copper Pipe connected with STREAMLINE Solder Fittings is exceptionally strong; it is LEAK and VIBRATION PROOF, and—IT CANNOT RUST. Since the conducting area through pipe and fittings is continuously smooth and uniform, there are no anchorage points to build up accumulation of foreign matter. Settlement of filled earth for water mains does not effect it.

STREAMLINE Copper Service Pipe represents one of the lowest cost forms of insurance that water works officials, who are responsible for the return on a heavy capital investment, can adopt.

STREAMLINE Solder Fittings and Copper Pipe are the most efficient materials for water works use, for general plumbing and heating, for many applications in filtration plants, in aeration lines and in heating coils using the sludge digestion system in sewage disposal plants.

When your city plans call for pipe and fittings for any purpose, consider STREAMLINE materials preferably before you buy. Send for Catalog W-3.

The word "STREAMLINE" is the Registered Trade Mark of the Mueller Brass Co., Port Huron, Michigan. Genuine STREAMLINE Copper Pipe is made only by this Company and is plainly marked for easy identification.

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

•STREAMLINE•
TRADE MARK U. S. PAT. OFFICE
COPPER PIPE AND FITTINGS

Two Men in a Radio Car

By WILLIAM HART HUSSEY
Police Commissioner, Mount Vernon, N. Y.

WILLIAM HART HUSSEY, PROGRESSIVE POLICE COMMISSIONER OF MOUNT VERNON, N. Y.

His latest step in modernizing the force is the installation of a complete ultra-high-frequency radio system

THE Police Department of Mount Vernon, N. Y., has a new police radio installation. Without increasing our operating budget or personnel, we are rendering faster and more comprehensive protection and service to the 65,000 inhabitants of this city in the metropolitan area.

Two men now operate each of our 18 patrol cars. With one man to a car, it was necessary sometimes to leave the car unattended while making an investigation. In Mount Vernon many homes are left vacant over extended periods. The absentees usually leave their keys with the Police Department, so that the officers may keep a watchful eye on the interiors as well as the exteriors of the property. Thus an officer may spend quite a little time away from his car. With the new system, one man always remains with the car in communication with headquarters. In this way, any car may be called into instant service to answer some emergency alarm.

At headquarters, a Western Electric 50-watt ultra-high-frequency radio transmitter has been installed in the same control room with the telephone switchboard, so that one man may handle all communications. All calls to headquarters from public or police telephones come in over this board, and the officer on watch may turn directly from the telephone to put a call on the police-radio system. On a table in the control room is a large-scale map of the city, with numbered "chess men," which represent the 18 cars equipped with Western Electric receivers. As these cars move about and report their activities, corresponding moves are made with these chess men by the radio officer on watch so that it is easy to see at a glance where each car is operating. A comprehensive log is kept at all times, entries recording the incoming calls from citizens as well as from the police personnel, and information is recorded concerning responses to these calls and the resultant activities. The communication room is located adjacent to the "desk" at police headquarters, with only a large plate-glass window separating the lieutenant on duty at the desk from the communication officer. A radio receiver is also installed in Police Chief Inspector Silverstein's office, so that he may hear all the radio communications of the system.

The self-supporting radio antenna mast at headquarters is an unusual engineering job, being 142 feet high, and its top is the highest point in Mount Vernon. Next door to headquarters is the service station for the radio cars of the Police Department. It is so arranged that a car may be driven right in beside the test and service bench, where maintenance work can be conveniently and speedily performed. Thus it is no longer necessary for the service men to work while exposed to an icy gale or the blazing sun.

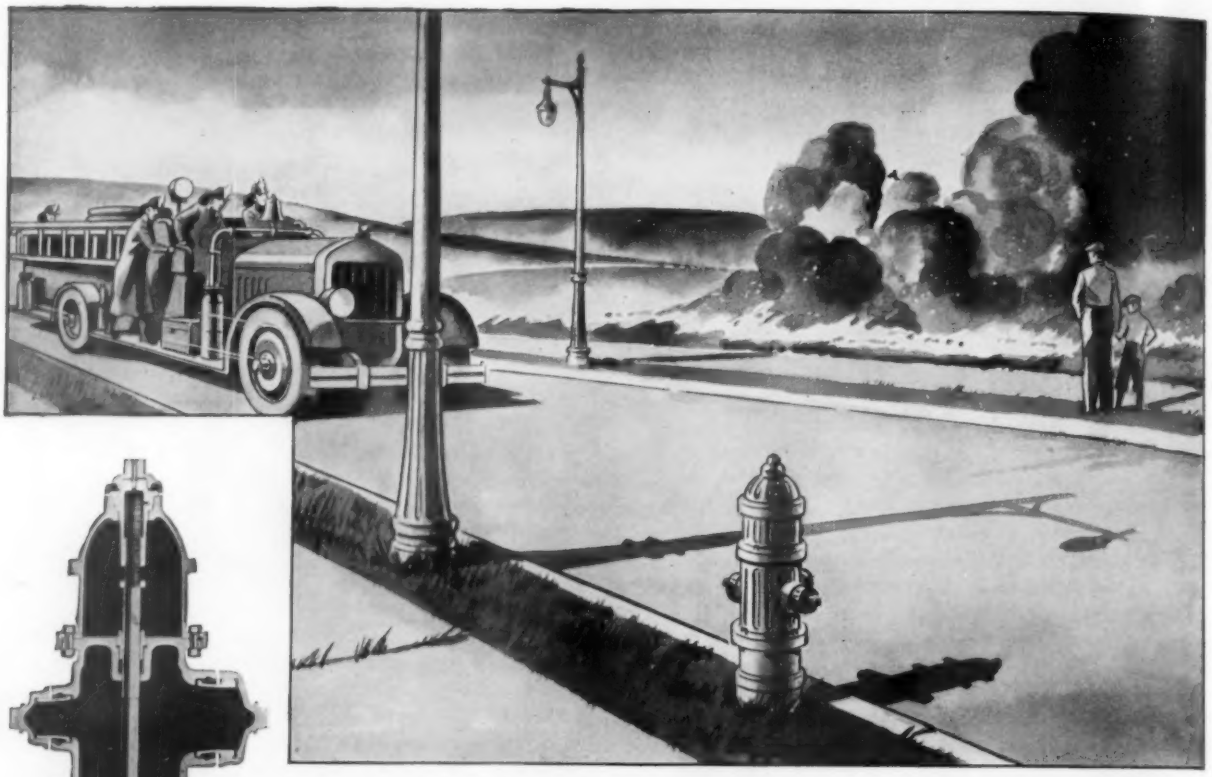
In choosing equipment, price was not the prime consideration. We investigated performance records of various types of equipment in other cities, and we made our selection with a view toward getting the best results possible over an extended period of time at minimum expense to the taxpayers.

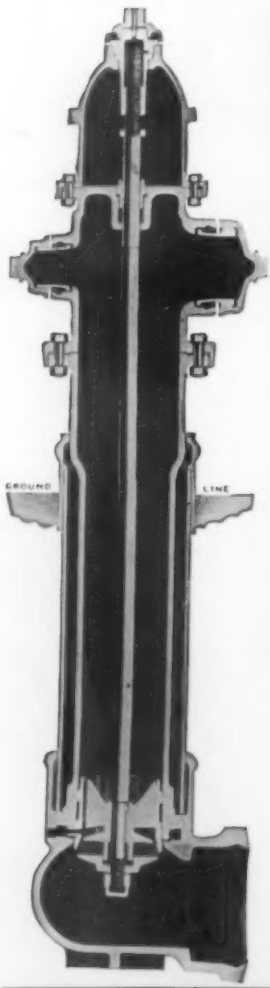
LEFT—RADIO CARS ARE DRIVEN IN BESIDE THE TEST BENCH OF THE SERVICE STATION ADJACENT TO THE MOUNT VERNON POLICE HEADQUARTERS

Here are Service Engineer M. A. Hoffman and Officer John Gleason

RIGHT—THE HIGHEST POINT IN MOUNT VERNON, N. Y., IS THE TOP OF THE 142-FOOT MAST FOR THE 50-WATT TRANSMITTER

"Great Grief! I'LL BET THAT HYDRANT AWAY OUT HERE HASN'T BEEN TOUCHED FOR 10 YEARS"





Don't worry. That hydrant is a Mathews. It will open, all right. And throw a full stream of water. And close tight. It's *built* for emergencies.

Just squirt in a bit of oil once or twice a year. That's all the upkeep Mathews Hydrants need, for every friction spot has at least one bronze surface.

Mathews Hydrants are built for the emergency of forgetfulness, just as they're built for the emergencies of bitter cold, traffic accidents, grade changes and heaving ground.

Specify Mathews. Remember every fire is an emergency.

Every moving part of a Mathews Hydrant works on at least one surface of rust-proof bronze. Mathews Hydrants don't stiffen with time. They're always ready.

Mathews Hydrants
BUILT FOR EMERGENCIES

R. D. WOOD CO.
400 Chestnut St., Philadelphia, Pa.

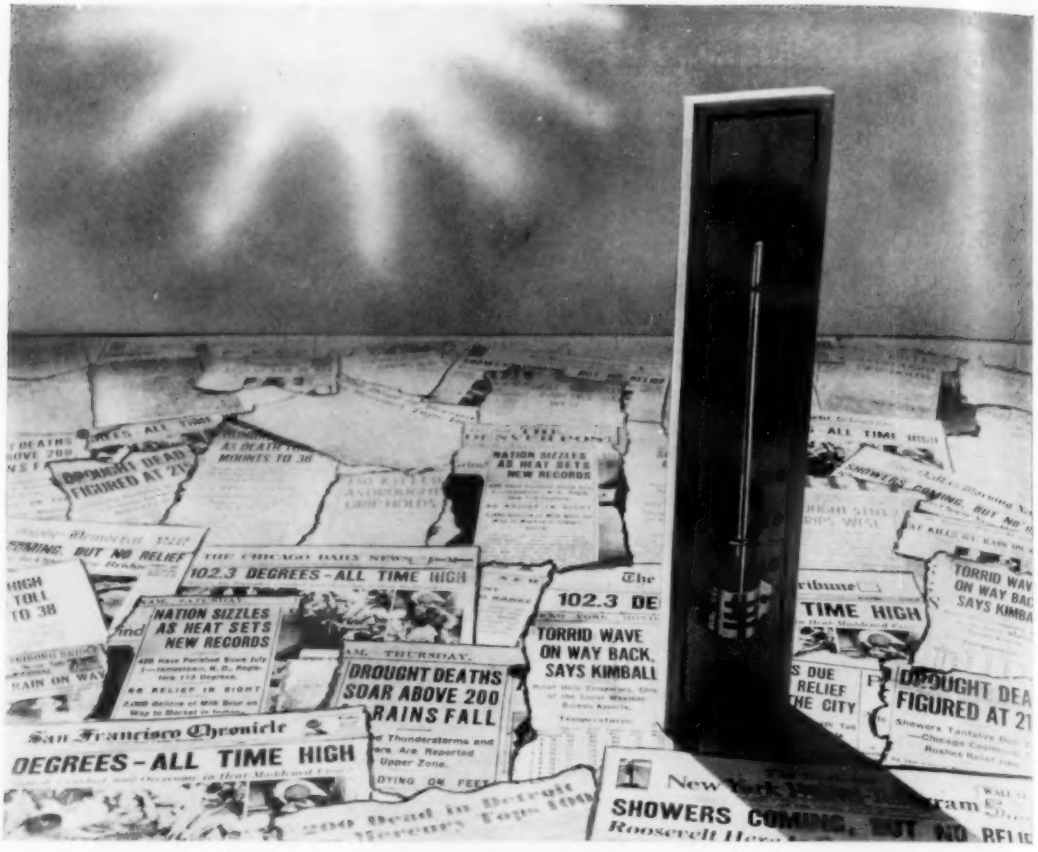
manufacturers of SAND-SPUN PIPE which is centrifugally cast in sand molds, and R. D. Wood heavy-duty gate valves for water works.

Financing City Pavements

Assessment Still Prevails, But Federal and State Aid Have Had Mushroom Growth

THROUGH the cooperation of the same group of municipal officials, City Engineers and Street Superintendents that furnished the data on types and yardage of street paving published on pages 165 to 180 of the 1937 Edition of The Municipal Index, we are publishing below a wealth of data on the methods of financing the paving of streets in cities in every state. We again express our appreciation of the assistance rendered by our readers in making this material available for study and comparison.

City and State	Per Cent Paid By Assessment	Per Cent Paid From General Funds	Other Methods Used, and Notes
Alabama			
Anniston	Part	Part	
Attalla	100	....	
Birmingham	100	....	
Mobile	100	....	
Arizona			
Bisbee	....	....	WPA
Winslow	100	....	City practically all paved
Arkansas			
Fort Smith	100	....	Improvement districts
Hot Springs	100	....	WPA, by property owners with city equipment
Little Rock	100	....	Improvement districts
Mena	100	....	Improvement districts, U. S. Government aid
Morrilton	....	....	Bond issues
California			
Alhambra	10	20	70% gas tax allocation
Bakersfield	100	....	Gas tax
Berkeley	....	....	Gas tax funds from state
Chico	100	....	Improvement district bonds
Chula Vista	100	....	Since 1935 by PWA and bond issues
Culver City	....	....	State gas tax. No assessment for six years
El Monte	....	....	Gas tax, no assessment since 1929
Fillmore	100	....	
Fresno	5	5	90% gas tax funds
Glendale	....	Part	All by gas tax and Federal funds, 1935 and 1936
Los Angeles	1.2	98.8	City, county, state and Federal funds
Merced	100	....	Assessed against improvement district
Modesto	Most	....	District assessment, general fund and gas tax
Monrovia	....	10	General fund and tax on gas
Napa	100	....	
Oakland	....	50	Mostly from public funds at present Federal, city and state
Orange	....	....	Gas tax and Federal grant
Palo Alto	72	28	Street assessment bonds, general fund, state gas tax fund, WPA, PWA
Pasadena	....	....	Auto license and gas tax
Pomona	50	....	Bond issue and assessment
San Mateo	100	....	
Santa Cruz	100	....	
Santa Paula	....	....	State gas tax fund for state highways and streets of major importance, and WPA. No assessment in 1936
Ventura	....	....	Gas tax
Whittier	....	....	General funds for maintenance only
			Gas tax funds. PWA recently
Colorado			
Colorado Springs	Most	....	Frontage from special assessments, intersections from general funds
Denver	90	10	3% gas tax and assessed against abutting property
Fort Collins	....	....	Improvement districts, some WPA
Golden	100	....	Special assessment
Walsenburg	100	....	Special improvement districts
Connecticut			
Bristol	....	100	General tax
Darien	....	100	State aid funds or annual budget
Hartford	25	75	Assessing privilege not used past 3 years; work financed by Federal and state funds
Windsor	....	100	Current taxes
Delaware			
Wilmington	50	50	Bond issue
District of Columbia			
Washington	50*	50*	*For first paving only. Gas tax and general funds. Parties interested pay total cost
Florida			
Fernandina	66⅔	33⅓	Bonds
Jacksonville	66⅔*	33⅓**	Bonds. *Cost between intersections **Cost of intersections
New Smyrna	50	50	Bonded for paving in 1926
Vero Beach	100	....	No new paving or financing
Georgia			
Columbus	60	40	Special funds from bond issue and tax levy
Decatur	100	....	One-half to each side of street
La Grange	66⅔	33⅓	Assessment and baby bonds
Macon	66⅔	33⅓	General funds or bonds and assessments; some WPA; city's share from general fund
Rome	100	Variable	Permanent paving assessed against abutting property; temporary, city pays all
Waycross	66⅔	33⅓	
Idaho			
Boise	100	Intersections	Bond issue
Emmett	....	....	Bonds
Idaho Falls	100	....	Bond issue on special improvement district
Lewiston	....	....	Special assessment
Pocatello	95	5	Bond issue
Illinois			
Aurora	95	5	Special assessment and motor-fuel tax. No assessment since 1929
Belleville	....	....	Gas tax. No assessment since 1931
Chicago	100	....	Special assessment
Danville	....	10	Gas tax, PWA, WPA
Fairbury	Formerly 60	....	Gas tax
Forest Park	....	....	Gas tax
Jacksonville	....	10	Gas tax and city funds
Kewanee	....	10	Gas tax, general funds and WPA
Lake Forest	100	....	
North Chicago	....	....	PWA, WPA and gas tax
Oak Park	....	....	Gas tax funds
Robinson	100	....	Assessment and gas tax funds
Rockford	....	....	Special assessment until 1934—since then by Government grants
Indiana			
Gary	100	....	Barrett Law
Hammond	100	....	Federal, state or special assessment
Indianapolis	100	....	Resurfacing is financed 25% by assessment, 75% from general funds
Lafayette	100	....	WPA
La Porte	100	Intersections	Barrett Law
Mishawaka	100	Intersections	Barrett Law
Richmond	100	Intersections	
South Bend	100	....	Assessment against abutting property
Iowa			
Ames	100	....	Special assessment against benefited property
Boone	100	....	Property assessment
Cedar Rapids	100	....	Assessed to abutting property
Centerville	100	....	Special assessments
Clear Lake	100	....	Last paving in 1930
Clinton	100	....	Special assessment and WPA. City buys materials
Creston	100	....	Special assessment
Davenport	100	....	City pays for grading; otherwise assessed to adjoining property
Fort Dodge	100	....	
Keokuk	100	....	Assessed to adjacent property. City funds for maintenance. City excavates all except volume of pavement
Marshalltown	100	....	
Mason City	100	....	Special assessment
Muscatine	100	*	Special assessment (signed agreement with owners). *City pays for all costs over ¼ the assessed value of property
Newton	100	....	Direct assessment
Ottumwa	100	....	
Red Oak	100	....	
Sioux City	100	....	Certificates
Waterloo	100	....	Special assessment
Webster City	100	....	
Kansas			
Atchison	70	30	Bonds
Coffeyville	100	Intersections	Also general improvement bonds


DROUGHT DEAD FIGURED AT 21
NATION SIZZLES AS HEAT SETS NEW RECORDS
102.3 DEGREES - ALL TIME HIGH
DROUGHT DEATHS SOAR ABOVE 200 RAINS FALL
San Francisco Chronicle
DEGREES - ALL TIME HIGH
TORRID WAVE ON WAY BACK, SAYS KIMBALL
SHOWERS COMING, BUT NO RELIEF

"Hot as H . . . !"

● HOT AS HADES: Every year during this period, heat waves bring about the usual run of troubles for Mr. Plant Operator.

1. Low water conditions, or actual shortage of raw water.

2. Excessive algae and other organic growths in raw water supplies, resulting in excessive tastes and odors.

3. Reduced turbidity in the water supply, making coagulation difficult and shortening filter runs.

4. Greater increased consumer demand.

In a paper read by E. A. Sigworth before the 4-States Section Meeting of the American Water Works Association, Philadelphia, Pa., April 22 - 24, 1937, a cross-section of returned Questionnaires indicated that hot weather was the period in which tastes and odors predominate.

Make Your Own Plans Now to Attend the Annual Convention of the Southwest Section of the American Water Works Association, to Be Held October 18-21, 1937, at the Hotel Driskill, Austin, Texas.

NUCHAR

230 PARK AVENUE
NEW YORK, N. Y.
●
417 SCHOFIELD BLDG.
CLEVELAND, OHIO
●
205 W. WACKER DRIVE
CHICAGO, ILL.

INDUSTRIAL CHEMICAL SALES

DIVISION WEST VIRGINIA PULP AND PAPER COMPANY

City and State	Per Cent Paid By Assessment	Per Cent Paid From General Funds	Other Methods Used, and Notes
Kansas (Continued)			
Emporia	100	Intersections	Bond issue
Galena	....	....	WPA project—about 2% donations
Hutchinson	100	....	Bonds and benefited district
Iola	75	25	
Kansas City	100	....	One-half bonds and one-half tax bills
Manhattan	100	....	City pays for intersections and business streets. Bond issue
Topeka	100	Intersections	City pays for all surface drainage necessary and grading
Wichita	85	15	Bond issues
Kentucky			
Ashland	....	....	WPA
Covington	Orig. const. 100 Recon. 50	 40	Assessment and general fund of city or bond issue; also WPA
Fort Thomas	100	....	City pays for intersections
Louisville	100	....	Paving warrants issued against property
Shelbyville	50	50	
Louisiana			
New Orleans	70	30	Paving bonds
Maine			
Bangor	....	50	Regular budget—50% state aid
Farmington	....	100	
Portland	....	100	Tax levy
Presque Isle	....	100	Regular appropriations
Waterville	....	75	25% state and Federal aid
Maryland			
Baltimore	15	85	General funds, special paving tax, special assessment and agreements with developers
Cumberland	75	25	General improvement bonds
Massachusetts			
Brookline	50	....	Bonds, general tax levy or betterment assessments
Chicopee	....	....	Tax levy or bond issue, ERA and WPA
Concord	....	100	Tax levy and bonds
Haverhill	....	100	Bond issue
Ipswich	....	100	
Lawrence	....	....	Tax levy
Lee	....	....	State 50%, county 25%, town 25%
Lynn	....	....	Bond
Medford	43	57	Usually 10-year bond issue. PWA with 30% grant recently
Methuen	46	54	Partly bonded
Milton	....	100	Tax levy
Needham	100	....	Betterment assessment
New Bedford	....	100	Bond issues
North Adams	....	....	Special appropriations of city funds, or WPA
Palmer	33⅓	....	State, county and town
Revere	....	20	WPA
Somerville	50	....	PWA at present; formerly under Highway Construction Account
Springfield	50	50	Bond issue and other forms. WPA
Watertown	50	50	Public streets by tax levy
Webster	....	100	County and state on through routes
Wellesley	....	100	Appropriations
Winchester	50–100	....	New ways on basis of thirds, state, county and towns. Assessments made only on newly accepted ways, 50% assessments appropriated on private ways opened for use prior to 1925, 100% on ways opened after 1927
Worcester	....	....	Tax levy and loans. Also state funds on percentage basis
Michigan			
Big Rapids	50	50	Special assessment
Dearborn	100	Intersections	Special assessment
Detroit	87	13	Short-term bonds retired from assessments
Flint	100	....	Special assessment
Grand Rapids	80	20	Special assessment, cost account, front footage
Hastings	60	40	Special assessment
Iron Mountain	....	10	WPA and Horton Road Act
Lansing	80	20	Bonds
Midland	....	....	Horton Road Act
Niles	100	Intersections	Special assessment
Pleasant Ridge	83⅓	16⅔	Bond issue. Some new work financed entirely by assessments against benefited property, in three payments
Pontiac	8.33 to 80	16.7 to 20	None built since 1930
Port Huron	100	Intersections and drainage	Bond issue and assessments
Saginaw	100	Intersections and drainage	
South Haven	40	Normally 60; this year 15	WPA 45% this year
Wyandotte	100	Intersections	Special assessment
Minnesota			
Columbia Heights	....	....	Bond issue. Cost of street and alley intersections, and in front or abutting public property, absorbed by city. Balance borne by assessable frontage
Duluth	100	....	Assessed to abutting property. City pays for intersections
Minnesota (Continued)			
Ely	50	50	Assessment
Faribault	100	....	Bonds, assessment. City pays for intersections
International Falls	80	20	
Rochester	100	....	Assessed to property, except intersections
St. Paul	33⅓	66⅔	Assessment, general and special funds, also WPA
W. St. Paul	....	30	Bond issue and county appropriation
Mississippi			
Canton	....	20	WPA
Hattiesburg	67	33	Bond issues. At present WPA
Missouri			
Chaffee	100	....	Special tax bills. At present WPA
Fulton	100	....	Special assessment
Higginsville	100	Engineering	Tax bills against abutting frontage, PWA and ERA
Jefferson City	100	....	Special tax bills
Kansas City	100	....	Special tax bills, bonds
Liberty	....	....	Tax bills
Maryville	75	25	
Nevada	100	....	Tax bills, Federal aid, FERA labor
St. Charles	100	....	Tax bills
St. Louis	Variable	Variable	Bond issue and special tax
West Plains	....	....	Tax bills
Montana			
Bozeman	100	....	Special improvement districts
Deer Lodge	100	....	Improvement district
Great Falls	100	....	Special improvement districts
Miles City	82	18	Bond issue
Missoula	100	....	Special improvement
Nebraska			
Fairbury	....	....	Tax levy for maintenance only at present. Some WPA
Grand Island	100	Intersections	
Hastings	100	Intersections	
Lincoln	100	....	
Nevada			
Reno	100	....	
New Hampshire			
Concord	....	100	Or by bond issue
Gorham	100	....	
New Jersey			
Audubon Borough	95	....	Bond issue
Bayonne	Variable	Balance	Assessed according to benefits except repavement
Camden	66	34	Bonds
Clifton	....	....	Assessment, either special or at large
Cranford	50	50	Short-term notes; later refinanced in 10-year bonds
Englewood	100	....	General obligation bonds of the city
Fair Lawn	....	....	For the past six years wholly by general taxation—90% state, 10% local
Hightstown	10	....	State and county aid
Midland Park	90	10	Assessed to property benefited
Milltown	95	5	Notes
Newark	95	5	Normally by either general or local assessments
New Brunswick	100	....	Bond issue
Plainfield	100	....	Assessed 100% first time
Princeton	50	50	WPA, state aid
Ramsey	....	....	In past by bonds. One road by state aid and general fund. Sheet asphalt construction by WPA funds
Roselle	100	....	All paving since 1931 has been done under borough and township aid from the state or by the CWA, ERA, or WPA. Under borough aid from the state, the state pays 90% and the borough 10%. The borough has paid its share of these projects and also the Federal projects from general funds. Previous to 1931 all costs assessed against abutting property
Somerville	....	....	Borough, county and state aid
South Amboy	....	....	Bonds—WPA partly
New Mexico			
Deming	....	....	Bond issue originally; WPA lately. Property owner pays for asphalt
New York			
Amsterdam	....	....	50% city budget, 50% local. $60,000 appropriated. None for last few years. All TERA and WPA
Auburn	50	50	Ten-year bond issue
Binghamton	50	....	Note issue. 50% of cost of paving assessed against abutting property
Bronx, N. Y. C.	6	94	Assessment and budget
Bronxville	100	....	Bond issue
Buffalo	100	....	All local assessment. Repaving, ⅓ assessment, ⅔ general funds
Dunkirk	100	Intersections	Assessed against abutting property
Elmira Heights	16⅔	....	Tax
Endicott	50	50	
Gloversville	75	25	Improvement bonds
Hamburg	66⅔	33⅓	

F-M TURBINE PUMP

REPLACES AIR LIFT AT GARLAND, TEXAS

. . . and Doubles Volume at One-Third the Cost . . .

Responsible officials of growing cities must look ahead to future water requirements.

At Garland, Texas, city officials knew that the air-lift system could not supply the demand much longer. In addition, facts presented by Fairbanks-Morse engineers showed that the old system was too costly. Accordingly, it was replaced by an F-M Deep Well Turbine Pump driven by an F-M motor a third smaller than the one required by the air-lift system.

The new pump delivers almost twice as much water per minute at a third the cost per gallon!

Municipalities have become accustomed to such saving from F-M Turbine Pumps. Precision-built—positively lubricated, the F-M deep well turbine guarantees low-cost gallons for many years to come.

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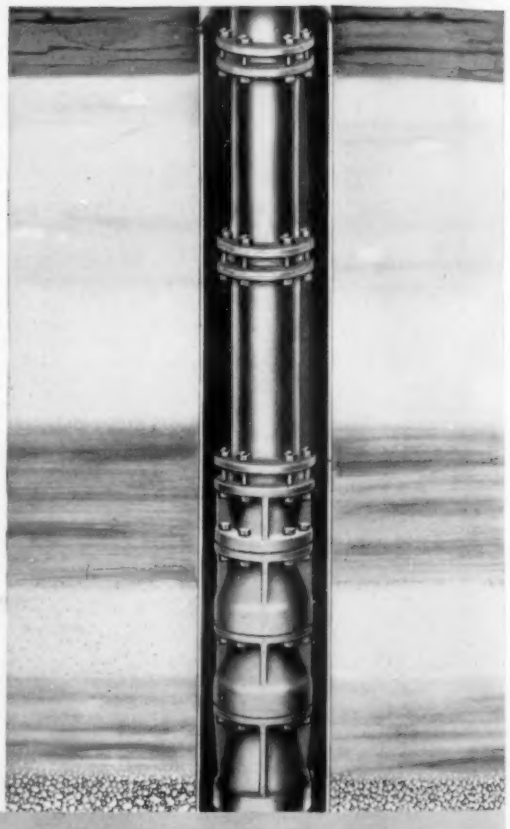

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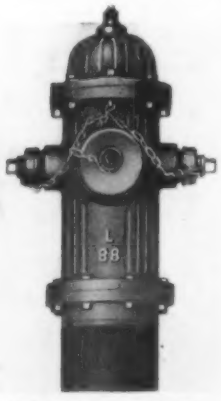
Pumps

City and State	Per Cent Paid By Assessment	Per Cent Paid From General Funds	Other Methods Used, and Notes
New York (Continued)			
Hoosick Falls	50	....	Bond issues
Jamestown	100	Variable	Bond issues, WPA
Kingston	75	25	
Little Falls	50	50	Generally by bond issue
Lockport	50	50	Municipal bond issue. For improvements ⅔ assessed, ⅓ general funds
Niagara Falls	100	Intersections	Paving warrants
N. Tonawanda	100	....	Paving bonds
Olean	100	Intersections	Temporary loans and bond issues
Oswego	66⅔	33⅓	Ordinarily, local assessments; now WPA
Port Chester	50	50	Bond issue
Poughkeepsie	50	50	City warrants
Queens	100	....	
Richmond, S. I.	100	....	Assessment
Rochester	100	....	Ordinarily, direct assessment. City pays for width over 26 feet
Rome	....	....	Bond issues for four years
Rye	....	....	General taxation
Salamanca	66⅔	33⅓	Bonds
Schenectady	100	....	Short-term notes
Seneca Falls	66⅔	33⅓	Bonds
Suffern	....	100	Taxes
Utica	66⅔	33⅓	
Wellsville	....	100	Appropriation from budget
North Carolina			
Henderson	40	10	Assessment and WPA 10% for maintenance from general fund
Shelby	66⅔	33⅓	Bond issue or general fund and assessment
Statesville	100	....	Budget
North Dakota			
Dickinson	100	....	Special assessment
Fargo	100	....	Special assessment, also PWA 30% grant
Ohio			
Akron	....	55	PWA
Athens	30	70	Bond issues
Bucyrus	98	2	Bond issues
Cadiz	....	....	By village alone
Canton	98	2	Sale of bonds
Cincinnati	5 to 98	....	Judgment of city council, bonds
Cleveland Heights	2 to 50	Balance	Bond issues, gas tax, Federal funds
Columbus	98	Intersections	Assessed upon abutting property
Crestline	98	Intersections	Assessment
Dayton	98	Intersections	Special assessment, gas tax
Dover*	95	....	5% from gas tax. *Includes also villages of Fairview, Parkview, N. Olmsted, Westview and Olmsted Falls
Hamilton	90	81	2% by WPA. County and State Highway Department
Lakewood	98	2	New paving 98% assessed to property; 2% and cost of intersections from general fund, except we have an unwritten law that cost to property should not exceed $12 per front foot. Recent paving has been paid for out of gas tax and motor-vehicle registration. In these cases, street widening was paid from gas tax, 100%
Lancaster	....	....	Gas tax, motor-vehicle tax and special assessment
Lorain	98	Intersections	
Mansfield	100	....	Special assessments, Federal aid, WPA
Massillon	98	Intersections	Foot frontage assessment
Middletown	80	20	Assessment and general taxation
Newark	98	2	
Norwood	....	1	WPA
Sidney	....	....	Gas tax and general obligation bonds
Springfield	98	2	Assessed front footage
Warren	98	Intersections	
Oklahoma			
Chickasha	80	20	Street improvement bonds
Oklahoma City	....	....	Property owners furnish material; WPA labor
Tulsa	100	....	Assessment in improvement districts
Oregon			
Oregon City	100	....	Improvement bonds
Portland	100	....	Assessment district
Pennsylvania			
Abington	....	100	County aid 2%
Allentown	100	....	
Ashland	25	75	
Beaver Falls	66⅔	33⅓	Foot frontage and WPA
Berwick	....	100	General fund or bonds
Bradford	100	Intersections	Assessment by front foot
Brownsville	66⅔	33⅓	
Clairton	100	....	Assessment
Dickson City	66⅔	33⅓	
Easton	....	....	Mostly general funds
Edgewood	100	....	
Edwardsville	40	60	General taxation
Elizabethtown	3	12	Taxes
Ellwood City	66⅔	33⅓	Abutting owners
Erie	100	....	Assessment
Ford City	....	100	
Greenville	66⅔	33⅓	
Harrisburg	100	....	Assessment
Hazleton	66⅔	33⅓	Bond issue
Lewisburg	66⅔	33⅓	Bonds
Lower Merion	....	100	Real-estate tax, some WPA and county aid. Curbing and walks 100% assessment
McAdoo	....	....	WPA
Morrisville	....	100	Taxes
Mt. Carmel	90	....	Abutting owners, county aid and gas tax
New Brighton	....	95	No assessment since WPA. Formerly 33% by property owners
Oil City	100	....	
Philadelphia	100	Intersections	State and city appropriation and assessment
Philipsburg	66⅔	33⅓	Borrowing from local agencies
Phoenixville	....	100	
Pittsburgh	80	20	Assessment and bonds
Punxsutawney	66⅔	33⅓	Abutting property owners
Reading	*	*	*Varies widely year to year. Assessment, bond funds and general funds
Sayre	66⅔	33⅓	Abutting property owners
Scranton	80	20	Special assessments
Swarthmore	....	100	Current income
Weatherly	....	....	Proceeds of municipal light plant and taxes
West Homestead	....	50	50% bond issue
West Reading	66⅔	33⅓	
Wheatland	66⅔	33⅓	Bond issue
Wilkinsburg	66⅔	33⅓	
Rhode Island			
Narragansett	....	....	Taxes
Newport	....	....	Direct appropriation and bond issues
Pawtucket	....	50	50% WPA
South Carolina			
Bamberg	....	....	WPA
Charleston	100	....	Abutting property
Clover	50	50	Bonds
Greenville	....	....	Voluntary assessment of property owners. Last paving on Oklahoma plan in 1928
Kingstree	....	100	WPA, bonds
Marion	50	....	PWA
Spartanburg	50	50	Bond issue
Sumter	36.7	18.3	Grant 45%; ⅔ of balance assessed. ⅓ of balance from general funds
South Dakota			
Lead	50	50	Direct levy
Redfield	30	70	Assessment. No street improvement this year, account of drouth and grasshoppers
Sioux Falls	100	....	Assessed to property
Watertown	10	90	Concrete or permanent type by special assessment. Low type by general obligation bonds
Tennessee			
Chattanooga	....	....	Bonds. No assessments at present. Formerly ⅔ assessed. General funds small
Knoxville	75	25	Improvement district petitions
Maryville	66⅔	33⅓	Usually by selling bonds
Winchester	84	16	
Texas			
Austin	85–90	15–10	Assessing abutting property owners by front-foot basis
Ballinger	....	....	Planned program by WPA with aid from property owners
Breckenridge	67	33	Bond, assessing abutting property, CWA and WPA
Bryan	75	....	Assessment and bonds 25%
Dallas	85	15	WPA
Galveston	50	....	Bonds and abutting owners assessed
Kilgord	....	....	By bonds. City pays for all street improvements, including curbs and all drainage costs
Laredo	75	....	Improvement bonds
Longview	66⅔	33⅓	Bond issue and assessment
Pampa	85	15	Bonds and assessing abutting property
Paris	....	....	Bonds 55%; PWA 45%
Quanah	33⅓	....	Bond issue
San Antonio	66⅔	....	Bond issue
Sherman	....	....	Bond issue, WPA
Wichita Falls	75	25	
Utah			
Helper	86	14	
Logan	....	100	
Richfield	75	25	
Vermont			
Burlington	....	100	Appropriation, state aid
Montpelier	....	....	Taxes or bond issue
Newport	....	....	General funds
Swanton Village	....	....	Taxes, voted each year
Vergennes	....	100	
Virginia			
Danville	....	50	Bonds. General levy
Fredericksburg	....	100	Current revenue
Hopewell	....	....	Bonds
Lynchburg	....	100	Current revenue
Richmond	....	....	Appropriation by city council. Also city's portion of state gas tax

Survey your works and system. Take stock of operating equipment . . . is it still up to the job it was installed for? How about power and head loss, line damage from vibration—and so on down the list?

Check up . . . then check with Chapman on any problems that involve valves, hydrants, gates, or operating mechanisms. Chapman can fill your bill from a standard line of waterworks equipment that's *complete* . . . that's designed both for the needs of today and the indicated requirements of the future . . . and built with extra structural stamina that means a long-extended lease on operating life, with no "extras" for maintenance.



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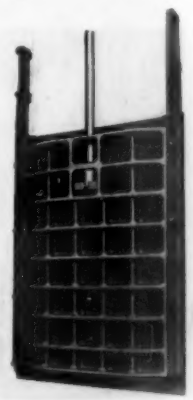
Chapman Sluice Gate

The **CHAPMAN VALVE**
MANUFACTURING COMPANY
INDIAN ORCHARD, MASSACHUSETTS, U. S. A.

City and State	Per Cent Paid By Assessment	Per Cent Paid From General Funds	Other Methods Used, and Notes
Washington			
Aberdeen	Local streets 100 Arterials 33 to 50	....	Local improvement district or highway fund
Auburn	100	....	Local improvement district
Bellingham	100	....	Local improvement bonds
Ellensburg	100	....	Improvement district
Everett	100	....	Local improvement district
Hoquiam	100	....	Local improvement district bonds
Seattle	15	85	General bond issue, gas tax, Federal funds and assessment. Also, private contract, very little
Spokane	100*	....	*Except gas tax portion. Local improvement district, 60c per linear foot of frontage from state gas tax
Tacoma	....	....	Local improvement district and state gas tax
Wenatchee	100	....	Local improvement district
West Virginia			
Bluefield	100	....	Assessment of abutting property
Follansbee	100	....	Bond issues and paving certificates
Morgantown	....	....	Bond issue. Paving, all work assessed. Also WPA. Owners pay for materials only
Wisconsin			
Antigo	100	....	Improvement bonds
Eau Claire	100	Intersections	Assessments on ½ of property frontage
Fond du Lac	75	25	Certificate and bond and cash
Fort Atkinson	100	Intersections	Bonds and special assessments
Janesville	100	Intersections	
Kenosha	90.5	9.5	City pays the contractor monthly estimates from a revolving fund. Assessments made to abutting property owner on front-foot basis, payable in one or ten installments plus 6% interest
La Crosse	80	20	Bonds
Milwaukee	80	20	Partly assessed. City costs from current funds
Oshkosh	100	Intersections	
Racine	100	Intersections	Special assessment
Shawano	....	100	
Superior	100	....	
Two Rivers	....	....	Up to 30-foot width, 100% assessed; over 30 feet, from general funds
Watertown	50	50	Bond issues—state and Federal aid
Waukesha	100	Intersections	Bonds
Wisconsin Rapids	66⅔	33⅓	
Wyoming			
Cheyenne	....	....	Assessment against property. Previously, 100% assessed; lately ⅓ from WPA

Municipal Asphalt Plants

Data Reported on Hot- and Cold-Mix Plants

THE figures below do not begin to show the total number of asphalt plants owned, leased and operated by municipalities throughout the United States. They do, however, indicate the general distribution of such plants, with types and other data worthy of consideration.

Cities should give more serious consideration to the large and small asphalt plants on the market today, particularly in those sections where no competing commercial plants are available. Patching and resurfacing, where areas to be repaired are in small sections and scattered, is the particular province of the municipal plant. A reasonable income may also be derived from furnishing hot-mix or cold-mix materials for private drives, garage drives and similar private works where a reasonable price may be charged, not in competition with local tax-paying industries. Some cities have found it necessary to install municipal plants because of combinations which have maintained prices at prohibitive levels.

	Number	Capacity per 10-Hour Day	Remarks
Arkansas			
Hot Springs	1	100	Plant rented, now owned
Little Rock	1	30	Not operating
California			
Los Angeles	2	800, 1150	
Colorado			
Denver	2	200, 300	
Delaware			
Wilmington	1	120	
Florida			
West Palm Beach	1	100	
Illinois			
Chicago	3	1,200 (total)	
Indiana			
Indianapolis	1	100	
Kansas			
Emporia	1	40	
Kansas City	1	75	
Manhattan	1	...	
Topeka	1	18	
Wichita	1	40	
Louisiana			
New Orleans	1	100	
Massachusetts			
Boston	1	...	
Methuen	1	30	
Springfield	2	250	
Worcester	2	125, 200	
Michigan			
Detroit	2	750, 750	
Flint	1	500	
Lansing	1	155	
Saginaw	2	200*, 20**	*Not operated. **For patching only
Minnesota			
St. Paul	1	200	
Missouri			
Jefferson City	1	50	For patching only
St. Louis	1	250	
Nebraska			
Lincoln	1	...	For maintenance only
New Hampshire			
Concord	1	250	
New Jersey			
Bayonne	1	...	Capacity unknown
Camden	1	250	
Newark	1	160	
New York			
Bronx, N. Y. C.	1	200	
Niagara Falls	1	250	
Queens, N. Y. C.	3	...*	*Two 2,000-ton plants and one 100-ton plant
Richmond, S. I.	1	245	
Rochester	1	200	
Ohio			
Cincinnati	2	250, 350	
Columbus	1	150	
Dayton	1	200	
Hamilton	1	50	
Oklahoma			
Oklahoma City	1	150	
Oregon			
Portland	1	625	
Pennsylvania			
Allentown	1	200	
Erie	1	200	
Harrisburg	1	200	
Philadelphia	2	300, 200	
Phoenixville	1	30	
Pittsburgh	2	400	Only one operating
Reading	1	100	
Scranton	1	175	
Tennessee			
Knoxville	1	100	
Texas			
Paris	1	40	
Sherman	1	100	
Vermont			
Burlington	1	120	
Virginia			
Lynchburg	1	70	
Washington			
Bellingham	1	14	
Seattle	1	500	
Spokane	1	500	
Tacoma	1	80	
Wisconsin			
Milwaukee	1	200	

What's a 100 YEARS *in the life of these small* CAST IRON *mains?*

•CORROSION RESISTING

Why not sidestep corrosion in your SMALL mains as well as those 4" and larger? McWane 2" mains are *cast iron* mains. Corrosion resisting. Rustproof! Everlasting!

•NO CUTTING EXPENSIVE PAVEMENTS

When corrosion sets in, leaks begin and pumping costs mount. That means cutting expensive pavements to replace the worn pipe. An expense you never face when you lay your small mains with permanent, corrosion resisting *cast iron* pipe.

•NO COSTLY REPLACEMENTS

Time diminishes the value of nearly everything except cast iron pipe. That's why it's standard for underground mains. Cost? Only a few pennies more per foot than you pay for a short-lived substitute. Investigate!

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For strong, tight, flexible cast iron water pipe joints *** Used on thousands of miles of pipe for more than 21 years *** Not a failure anywhere.

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HYDRO-TITE

Admitting Trade Wastes to Sewers

Part II

A Discussion of an Important Sewage Problem from the Standpoint of the Textile Industry

Alternative Solutions of Problems of Admission of Textile Wastes to Sewers

The alternative solutions of problems involved in the admission of wastes to sewers are:

1. Preliminary treatment to reduce the pollution of industrial wastes to the extent that trouble is not encountered at ordinary municipal sewage-treatment plants.
2. Equalization and proportioning of flow at the mill without preliminary treatment.
3. Planned programs of discharge so that acid wastes from one industry will neutralize alkaline wastes from another before the mixed sewage reaches the treatment plant.
4. Equalization of the character of the waste at the municipal treatment plant, without any equalization or regulation at the mills.
5. Design of treatment plant in order that it may purify the particular type of combination of industrial waste and domestic sewage which reaches the disposal works.

In most cases a combination of these schemes will give the most economical results. The first plan, i.e., the preliminary treatment of all troublesome wastes, is frequently adopted but is not necessarily the most economical solution, for in some cases a considerable burden of the expense is imposed upon the manufacturer who discharges highly polluted wastes.

A combination of the second and third plans for regulating the time and rate of discharge of wastes offers a way of reducing the overall cost of treatment. It does, however, involve some expense to the manufacturer for tanks and automatic discharge devices. Since the wastes must be discharged when the rate of flow of domestic sewage is largest, this scheme may necessitate the use of larger sewers than might otherwise be required.

Equalization of mixed-sewage characteristics at the treatment plant is sometimes a more economical solution. This necessitates the use of very large holding tanks or reservoirs at the treatment plant. It has even been suggested that there be two tanks each equivalent to a full day's flow of sewage. There would be considerable difficulty in preventing putrefaction in such tanks, and they might be troublesome to de-sludge.

Another scheme would be to bring all industrial wastes to the municipal plant in a separate system of sewers and to equalize the wastes and proportion them with the sewage at the plant. This would require small equalizing tanks. Moreover, there would be little difficulty in preventing decomposition and nuisance in tanks where the industrial wastes are from textile industries. A modification of this plan is used at the new Spindale, N. C., plant. The cost of additional sewer lines would, in some cases, be great. However, since industrial plants are often concentrated in a limited district, their wastes might be collected and equalized in tanks located in the industrial district. The equalized wastes could then be discharged into the sewer in proportion to the flow of domestic sewage.

The design of sewage works to treat without difficulty the particular mixture of industrial waste and domestic sewage is a very important method of handling liquid trade-waste disposal problems. The ways in which they may be done are exceedingly numerous.

Legal Aspects of the Admission of Trade Wastes to Sewers

The greatest objections to the admission of trade wastes to sewers arise from the problems involved in the shifting of the major burden of expense of treating trade wastes from the manufacturer to the general taxpayer. One view of this question is that the manufacturer is a large taxpayer in the community and is justly entitled to sewerage service. However, sewage containing the manufacturer's wastes is usually so much more expensive to purify than ordinary domestic sewage that a disproportionate amount of the expense is borne by other taxpayers.

One method of equalizing the expense is to distribute a part of the extra cost among the manufacturers who turn the wastes into the sewers. The strength and quantity of each trade waste should be taken into account in figuring out the charge. The amount of taxes paid by the mill owner influences the charge, in that they entitle him to a certain amount of free service. This scheme has been used in England, and in many cities the manufacturer has the choice of either giving his waste a certain amount of preliminary treatment or paying for the privilege of discharging untreated wastes into the sewers.

In the United States the solution of the problem of fair distribution of expense is not difficult in states where all sewer service and sewage treatment may be charged for in the same manner as water and light service. As charges for sewer service on a public utility basis become more widely used, the problems will be much simplified. Again, however, the manufacturer would usually have to pay for sewer service at a rate which is commensurate with the difficulty and expense of treating his particular waste.

In England, under early laws, a large proportion of the manufacturers obtained the privilege of discharging wastes into sewers, while the remainder were required to give their effluent complete purification before it could be discharged into streams. Frequently the manufacturer who was compelled to treat his waste had also to contribute through water rates or taxes to the treatment of the waste of his competitor. This was overcome by local authorities entering into agreements with the manufacturers. The

Here's "Something to Show" for relief funds!

Typical section of Atlanta's new concrete pipe sewers. A well-engineered and well-constructed job with excellent alignments and uniform gradients throughout. Pipe is carefully bedded and back-filled; joints made with portland cement mortar to minimize infiltration. Work was executed by Works Progress Administration of Georgia, District No. 5, in cooperation with Clarke Donaldson, chief of construction and W. A. Hansell, assistant chief of construction in charge of sewers for City of Atlanta.

34 MILES OF ENDURING CONCRETE PIPE ADDED TO ATLANTA'S SANITARY AND STORM SEWER SYSTEM

Atlanta's 7-million-dollar program, including new sewage treatment plants, new sanitary and storm sewers, extensions and outlets, is now nearing completion. 34 miles of concrete pipe ranging in size from 8 in. to 102 in. has already been placed under various WPA and FERA projects.

Atlanta joins the Sanitary District of Chicago, Louisville, Detroit, Minneapolis and many other cities which rely on concrete for their sewers. Concrete pipe, like monolithic concrete, has proved its merits for a wide range of sewer types, sizes and conditions. It is strong and durable. Minimizes infiltration and leakage. Is moderate in cost and serves with little maintenance.

Whether your sewers are 12 ft. in diameter or a few inches, build them of concrete and be sure!

Write for pipe bulletins on jacking concrete pipe, building pipe sewers in open cut, pipe in tunnel, subaqueous methods, and standard specifications of the A.S.T.M.

PORTLAND CEMENT ASSOCIATION
Dept. 8-4, 33 W. Grand Ave., Chicago, Ill.
Please send me concrete pipe bulletins 9 to 14.

Name _____
Position _____
Address _____
City _____ *State* _____

following quotation from an article by M. J. Hurley in the Proceedings of the Association of Managers of Sewage Disposal Works, England, sets forth the most important points covered in these agreements.

"As stated above, the whole of the liquid trade wastes of the Shipley urban district are now dealt with at the Council's sewage works. The agreement with each manufacturer was a matter for individual negotiation, but I give below the main points covered in these agreements.

"(3) The firm to remove grit and coarse solid matter to the satisfaction of the Council.

"(4) The firm either to extract or not to extract grease from the effluent for the whole of the period of the agreement. The manufacturer is not given the power to extract the grease when the market is good and then turn the crude effluent into the sewers when the market is less favorable. This clause is a safeguard in case the Council should at any time decide to install a grease-recovery plant.

"(5) The temperature of the effluent as discharged to the Council's sewers not to be higher than 150 degrees F.

"(9) Arrangements for assessing flows. In a few cases the trade effluent itself is metered, but more often the flow is based on the water consumption. In many cases the basis is six-sevenths of the total water consumption.

"(10) The firm to pay at an agreed rate per thousand gallons of effluent discharged into the Council's sewers. The charge is based in every case on the strength of the effluent to be treated. The prices for the principal trade effluents dealt with at Shipley are given below:

Spent gas liquor	1s 9d per 1,000 gals.
Wool suds	4½d per 1,000 gals.
Mixed effluent from dye works	3½d per 1,000 gals.

(When considering these figures, it should be remembered that after arrival at the sewage works the liquid has to be pumped for treatment.) [EDITORIAL NOTE.—1,000 Imperial gallons equals 1,200 U. S. gallons.]

"This form of agreement has been found to serve excellently. The clause as to removal of solids has only been to reduce treatment at the mills to a minimum to avoid danger of nuisance from smell."

Sanitary districts in the United States have for the most part been concerned with the problems of collecting and treating domestic sewage, but as the demand for better protection of stream purity grows, these organizations will probably be called upon to deal with trade-waste problems in much the same manner as similar English local authorities.

The regulations applied by city governments for the protection of sewers and municipal treatment plants are analogous to the English regulations quoted above. The Milwaukee, Wis., regulations and standards are an example of American practice. The Milwaukee Sewage Commission has the power to regulate the amount and kind of industrial waste discharged into the public sewer system. This Commission issues orders for removal or for pre-treatment of wastes according to the following set of standards:

"1. Removal, from industrial wastes, of such solids as tend to settle in sewers, restricting flows with the possibility of ultimate stoppage of flows.

"2. Removal of pre-treatment of wastes containing active chemical ingredients, which through their activity result in destruction of sewer structures.

"3. Removal or pre-treatment of wastes which may be deleterious either to the purification process or to the plant structure.

"4. Removal from wastes of all free oils, greases, tarry and resinous substances.

"5. Removal of wastes from sewers which may by their presence result in injury or death to men engaged in active sewer work.

"6. Isolating from sewage such solids as are eliminated in process and later are discharged to the sewer as a means of disposal.

"7. Removal of all uncontaminated waters from the general sewage flow, where storm sewers are available."

Each Local Situation an Individual Problem

It should be emphasized that the problems involved in the question of discharge of industrial wastes into municipal sewers are very complicated, especially as regards the selection of the most economical solution. A complete and thorough study of the problems of each community is required before the desirable solution can be selected.

When studying problems of admission of trade wastes to sewers, the various wastes should be classed in one of the following four groups:

1. Wastes that require no treatment.
2. Wastes that require equalization of character and regulation of discharge.
3. Wastes that require, in addition to equalization of character and regulation of discharge, some preliminary treatment.
4. Wastes that should be excluded from the sewer.

The group into which textile wastes fall depends upon local conditions, such as character of the particular waste, its volume in proportion to that of the domestic sewage, the total amount of industrial waste produced in the community, the size of sewers available, the type of treatment plant used and other factors.

ACKNOWLEDGMENT.—With but a few slight changes, the material for this article is taken from "Textile Waste Treatment and Recovery," published by the Textile Foundation, Inc., Washington, D. C., price $1.00. Readers of THE AMERICAN CITY will recognize in this series of articles a very genuine desire on the part of manufacturers, as far as the textile industry is concerned, to cooperate in a solution of the trade waste problem. The approach is socially acceptable and presents an economical solution for both parties concerned in each individual problem.

The Sewage Bug—Long May He Slave!

WE "sewage men" should not disdain and nonchalantly shrug
When credit is accorded our good friend the "sewage bug."
No bugs—no trickling filters—no activated sludge—
No digesters to change foul stuff to black and tarry fudge.
Why, many sewage-treatment plants would not be worth a hoot
If we didn't have those little bugs to get in there and root!

Our job's to keep them healthy and fit to do their work
And if we just do our part right, the bugs will never shirk.
The temperature, pH and food and oxygen controls
Must be maintained with vigilance. These bugs are choosy souls!
Sometimes it nearly drives us "bugs" to keep the bugs content.
But when we do, it shows up in the treated effluent.

We see and hear and read a lot about the operator.
How *he* does this and *he* does that as trouble terminator.
But when you get right down to facts, here's one you can't deny—
Our plants would fail without the bugs, no matter how *we'd* try.
We need the bugs and they need us in our strange occupation,
The answer sums up in one word. That's right—COOPERATION!

—From *The Digester*, edited by W. H. Wisely, Assistant Sanitary Engineer, Division of Sanitary Engineering, Illinois Department of Public Health.

LFC

"Lynchburg Castings"
have something on the ball

Maybe it's our many years of specialized experience—maybe it's our modern equipment, enabling us to make quick deliveries — or — maybe it's a combination of both that rates "Lynchburg" so high with eminent engineers. . . For that difficult "Special" job — write, wire or phone "Lynchburg" for quick estimates.

Bell and Spigot Pipe and Fittings. From 4" to 54."
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Super-de Lavaud Centrifugal Cast Iron Pipe.

Special Iron Castings for the Chemical Industry

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General Office: Lynchburg, Virginia

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Chicago, Ill.

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New York, N. Y.

LOW TOTAL COST
of operation has been the objective in developing
DE LAVAL *Centrifugal* PUMPS

• De Laval 12 in. pumps to handle 2080 g.p.m. each of sludge containing one per cent of solids.

The INITIAL EFFICIENCY IS HIGH

and long sustained, primarily due to the De Laval Labyrinth Wearing Rings, which are used in all cases. As compared with older pumps, the higher efficiencies now obtained will repay the cost of De Laval pumps in a short time. Renewable wearing parts are used at all points subject to wear. As the pumps are built to limit gages, these parts are interchangeable and renewals ordered by number can be installed at minimum expense and without delay.

Each pump is guaranteed as to characteristics and operation and is tested at our Works.

3201

DE LAVAL STEAM TURBINE COMPANY, TRENTON, N. J.

TREATMENT TRAILER

Should you locate Jeff Corydon and this trailer in your city, let him demonstrate the MODERN WAY OF FEEDING CHEMICALS. Or write for Bulletin "PH."

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Double disc—parallel seat
Recommended for working pressure up to and including 175 pounds

Extra heavy—extra strong—extra safe
Highest Grade Materials
Finest Workmanship

BOOKLET

M. & H. VALVE & FITTINGS CO.
ANNISTON, ALA.

Fig. 67
A.W.W.A.

Forward Steps

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

The Community Recreation System of Decatur

DECATUR, ILL.—The flourishing recreation program of Decatur is an outstanding example of what can be done by focusing the attention of all groups and individuals on the value of public recreation and making them a part of it by enlisting their help. This city, with a population of 57,510, now has a permanent tax-supported Community Recreation Association, the 18 playgrounds of which had, last summer, an attendance of 750,000 from among the 12,000 school children and an unknown number of adults.

The Superintendent of the system, Charles K. Brightbill, pays high tribute to the work done by H. Ray Myers, a member of the Recreation Board in this city, who created and fostered the initial interest, helped to secure funds for facilities and leadership, and pointed out the better use that could be made of what the schools and parks could offer. On several occasions, the City Commission, the Park and School Boards and officials of the Recreation Association were called together to discuss aid for recreation and the use of available facilities. All groups cooperated wholeheartedly.

The plan for lighting Decatur's playgrounds was conceived by Mr. Myers, who was largely instrumental in securing the necessary financial foundation. Knowing that a play area equipped for night activities would draw crowds and increase public interest, he persisted until the first playground was lighted. Donations were received from industrial clubs, the Police and Fire Departments and neighborhood parent clubs. Labor for the erection of the lights was supplied by the city. Four additional grounds were lighted that first year, by financial aid from service clubs and individuals. This year two more play areas have been equipped with floodlights.

Upon engaging trained leadership, an effort was made to obtain Government financial aid, and from the Works Progress Administration funds were secured which made a good program possible. For five days each week, from 9:00 A. M. to noon, and from 1:00 to 4:00 P. M., a broad program of constructive activities is carried on in all the city's playgrounds. Some of the grounds have night programs under great floodlights until 9:30 P. M. There are 48 paid directors in charge of the various programs. Baseball and other mature sports are enjoyed on the larger grounds; softball and less strenuous games for an intermediate class on other grounds; and activities for children only are held during the morning and afternoon sessions at the play centers.

There are stunts for boys and girls; children's games; nature study; handicraft; story telling; puppetry; music; horseshoe pitching; croquet; paddle tennis; box hockey; a rhythm band for small children; folk dancing; and various types of tournaments. Concerts given by the Decatur WPA band are a feature. A picnic service is available, and kits of equipment for games. Sprinkling showers have been set up for use by children during extremely hot weather. The Y. M. C. A. makes its swimming pool available for boys who are registered at the playgrounds. Public dances are held weekly in the park pavilions.

All but four of the playgrounds have organized parents' clubs. Staff meetings are held each Saturday morning at the Association's headquarters. Periodical inspection tours of the grounds are made by civic groups, led by recreation officials.

This year the Community Recreation Association plans to have a program centering around the life of Abraham Lincoln, with all activities culminating in a Lincoln pageant at the close of the ten-weeks session.

WILLIAM H. HERRING.

A Bridge of Flowers

SHELBURNE FALLS, MASS.—In the summer months of every year, this village cultivates a spot of such beauty that few poets of nature can resist dedicating their verse to it, a bridge laden with bloom and trailing vines.

The village of Shelburne Falls consists of two small towns, Shelburne and Buckland, divided by the Deerfield River. Two bridges cross this river a few yards apart, one on the famous Mohawk Trail, and the other an abandoned trolley bridge which carries the water mains from one town to the other. In 1929, Walter Burnham, now deceased, spoke to his wife of the possibility of beautifying the weed-covered bridge. She took the idea to the Woman's Club, and it found immediate and enthusiastic response. Committees were appointed, and money was raised by subscriptions. A well-known nursery was called in for advice, and soon plans were drawn up, blueprints made, and the work underway. On the north side of the bridge a fence was put up as the foundation for a vine windbreak. The vines now extend the length of the 400-foot bridge. Along the north side of the gravel walk are planted hardy perennials, and on the south the annuals are set out.

The Chairman of the "Bridge of Flowers" Committee gives hours of her

CIRCLE A BLEACHERS IN ONE OF DECATUR'S FLOODLIGHTED PLAYGROUNDS

EVERWEAR PLAYGROUND EQUIPMENT AS USED IN DECATUR

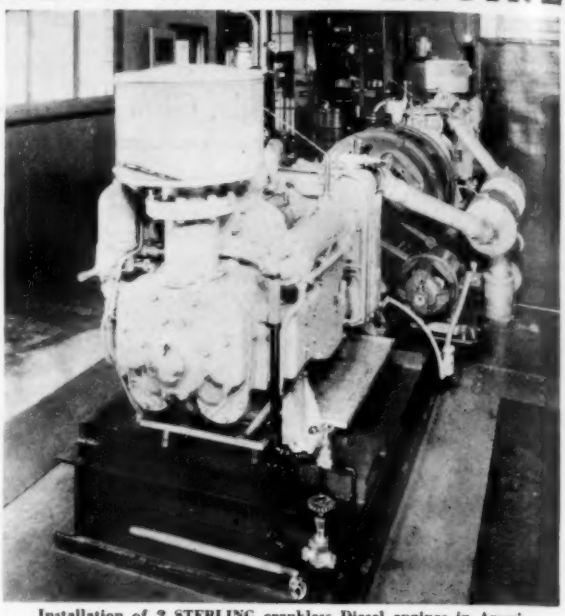
Thousands of hours of preliminary testing proved
THE STERLING CRANKLESS DIESEL ENGINE

built under
"MICHELL CRANKLESS ENGINE"
patents

Service reports state:

"I recently inspected both engines, and found all injection nozzles clean and free from carbon. One piston was removed and the head was absolutely clean and no hard carbon was baked on it as I have observed on other Diesels, and the rings were free.

"Several slipper pads removed for inspection showed the babbitt on these pads to be gray, with no bright spots or signs of wear, and without any cracking due to high bearing pressures. The babbitt on these pads looked identical with the babbitt on new pads and as though they had never been used. I measured the clearance on all slipper pads and found them identical with the original clearances, with no sign of wear on either pad or slant disc surfaces. The slant discs were absolutely free from any marking or scratching."



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will clean the entire sewer wall, top, and sides as well as the bottom, cutting and removing the roots and caked sediment, putting the sewer system in almost 100% clean condition.

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NEWTYPE WATER GATES

Built to A.W.W.A. Specifications. All parts amply strong, with simple, positive and dependable operating mechanism. Built in sizes up to 60 in. and for manual, gear, electric motor, or hydraulic cylinder control.

Send for Bulletins

THE KENNEDY VALVE MFG. CO., Elmira, N. Y.

THE BRIDGE OF FLOWERS IN SHELBURNE FALLS

time to the supervision of the gardening work. The expenses were covered during the first few years by money raised on benefit food sales, dinners, etc., but now contributions are just about sufficient. The whole village is extremely proud of what is believed to be the only one of the kind—its "Bridge of Flowers."

ELEANOR BENJAMIN,
Corresponding Secretary, Woman's Club.

A Wisconsin City Eliminates the Hand-Bill Nuisance

SOUTH MILWAUKEE, WIS.—Probably every American city of any size has at some time or other made an attempt to eliminate, or at least abate, the nuisance of having advertising handbills clutter up the doorways of apartment houses or the porches and lawns of private homes. It is well known that the United States Post Office Department has ruled against stuffing handbills into private mail-boxes in homes or apartment houses. At least one Milwaukee apartment-house owner has provided a separate pigeonhole in a homemade wall cabinet in the lobby, so that each tenant can claim or destroy his lot of circulars each day. Of course, in many apartment-house lobbies there is not sufficient room to install a special cabinet for handbills.

It has remained for the South Milwaukee city authorities to take drastic action to eliminate the delivery of handbills and circulars entirely, if the apartment-house owner or home-owner will apply to his house entrance a special plate, furnished by the city, reading as follows:

"Official Notice! No Handbills. Ordinance No. 212. City of South Milwaukee, Wisconsin."

The plate is black and silver, and the householder is expected to install it above or below the doorbell, as shown in the illustration. In this case the City Clerk, H. W. Dahling, is applying one of

"OFFICIAL NOTICE! NO HANDBILLS"

the first of the plates on the wall of an apartment house in South Milwaukee.

Shortly after the passing of the handbill ordinance, more than 40 applications had been received at the City Hall, and, with additional applications coming in every day, the majority of South Milwaukee residences and apartment houses will shortly have been supplied with the special plates.

There is no charge for the plates. Mr. Dahling explains that the cost of the plates is more than covered by the income to the city from the license fee charged all handbill distributors; that is, $1 per permit. At the time of the distribution of the first plates, 25 handbills distributors had been licensed in South Milwaukee. Violators of the ordinance are subject to a $25 fine.

In connection with the new ordinance covering handbills, Police Chief Frank Briesemeister declared: "The people who do not want to be bothered by handbills are certainly not getting them, if the lack of complaints and arrests is any indication."

City Clerk Dahling, discussing the same subject, said: "Since the new ordinance was put into effect, we have not had a complaint of violation by handbill distributors, and no arrests have been made under this ordinance."

JOHN E. HUBEL.

The Newest Major Grade-Separation Project in Texas

TYLER, TEXAS.—The formal opening of the new $312,740 Poplar-Beckham overpass was held in this city on June 25. Miss Gertrude Anne Windsor, Queen of the Texas Rose Festival, cut the beautiful "garland of roses," allowing the first traffic to pass over the 1,325-foot span. State Highway, city, county, Chamber of Commerce and other officials attended the ceremony. The principal address was given by R. L. Bobbitt, Chairman of the Highway Commission, who was introduced by County Judge Brady Gentry. Oscar Burton, President of the Tyler Chamber of Commerce, was master of ceremonies, and Will B. Marsh, a former Tyler citizen, represented the city on the program.

This is one of the major grade-separation projects in Texas. The whole

THE POPLAR-BECKHAM OVERPASS IN TYLER, TEXAS

POOL HEALTH

THE popularity of any Swim Pool—municipal, club or private—depends upon the condition of the water. To be absolutely safe, pool water should be crystal-clear and kept in constant circulation.

Graver Swim Pool equipment insures water that is actually "pure enough to drink." Graver units are the result of years of sound engineering and designing experience.

MUNICIPALITIES . . . COUNTRY CLUBS . . . ESTATE OWNERS . . .

If you are planning a pool, be sure to send for the Graver Book on Design, Construction and Operation of Modern Pools. It is chuck full of first-hand data presented in an interesting, comprehensive way. You may have a copy on request.

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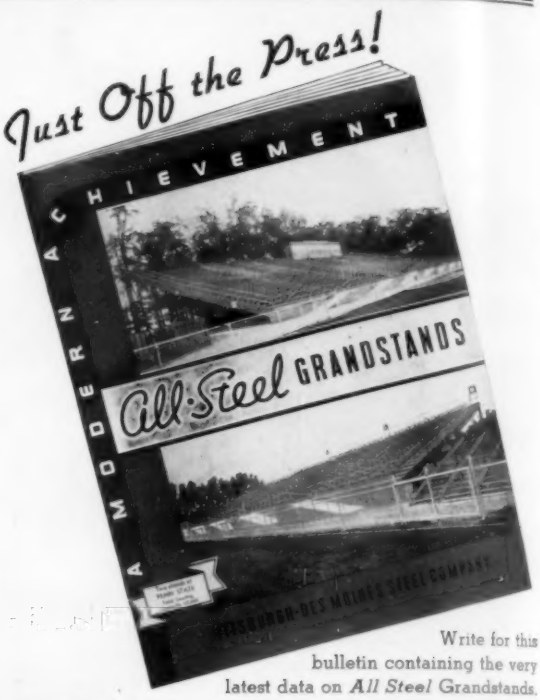
Just Off the Press!



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INSTALL PROVEN METERS

The Sparling is a velocity type meter, registering directly in gallons, cubic feet or any other volumetric unit desired.

Simple, sturdy construction of long wearing, corrosion-free materials.

All parts interchangeable.

With auxiliary Indicator-Recorder, permanent records of hourly, daily and weekly water production and distribution are provided.

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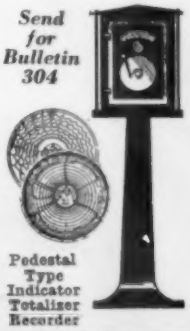


Pedestal Type Indicator Totalizer Recorder

SPARLING

945-951 N. Main St., Los Angeles
NEW YORK CINCINNATI
CHICAGO

MURDOCK *Outdoor* BUBBLE FONT

Popular with Boards of Education, Park Supts., Waterworks Supts., Health Officials and Recreational Directors, because it is

TROUBLE-PROOF

Will not freeze — Will not rust
Self-draining — Non-squirting
Lowest upkeep cost

Modern type bubbler extends well above rim of basin so latter may overflow in case of drain stoppage.

If you desire to modernize old Murdock fountains, write for complete information to

The Murdock Mfg. & Supply Co.
Cincinnati Since 1853 Ohio

Approved by Over 900 Cities

Equal to "Jung Suction" AER-O-MIX AERATOR-MIXER *Is the Claim of Some*

But Why

Patented

take chances on any—but the accepted standard. A patented aerator-mixer with a trade-mark registered in U. S. Patent Office to give you assurance you are getting *the* Aer-O-Mix that positively aspirates or inhales air or other gases in finely divided bubbles through multiple tubes—and provides, simultaneously, intimate mixing of liquid with chemicals or with other liquids. Gravity or motor-driven operation. Inside or outside installations. Small space requirements.

IN WATER, SEWAGE AND INDUSTRIAL WASTE TREATMENT

Write for new illustrated folder

Vogt Mfg. Co., Inc., Box 1122, Louisville, Ky.

trafficway, spanning the Cottonbelt Railway yards, is lighted with sodium vapor lights. It is the outstanding lighting project of its kind in the Southwest.

HAROLD J. BRYANT,
General Manager, Chamber of Commerce.

Wagner-Steagall Housing Bill Scheduled to Pass in Amended Form

AS this issue goes to press, word from Washington indicates the probability of early passage by both houses of Congress of the Wagner-Steagall Housing Bill in amended form. The original terms of the bill were outlined in THE AMERICAN CITY for March, 1937, page 87. On July 23 the Senate Committee on Education and Labor reported the bill with amendments as suggested by the President and by some members of the Committee. The American Federation of Housing Authorities outlines the bill in its amended form as follows:

The financial provisions direct the United States Housing Authority to sell its bonds, guaranteed by the United States, in the amount of $700,000,000, and during the next three years to "make loans to public housing agencies, to assist the development, acquisition, or administration of low-rent housing or slum clearance projects by such agencies." Such loans may cover the total cost of a project and shall bear interest at not less than the going Federal rate at the time the loan is made. The amortization period is 60 years. In addition to loans, the United States Housing Authority is empowered to make annual contributions to public housing agencies in order to achieve low rentals. There is an appropriation of $26,000,000 to cover annual grants and administrative expenses for the first three years.

As an alternate method, the bill now offers a plan which the local authorities may accept if they prefer it; namely, a 40 per cent outright capital grant of which 25 per cent would come from the appropriation, and 15 per cent from unemployment relief funds; a 20 per cent contribution from the local authority, and the remaining 40 per cent a loan from the United States Housing Authority.

The New York Times, July 26, says editorially:

"The Wagner-Steagall bill ought to pass both houses at this session. It is too important to be lost in the shuffle as Congress strains to get home. Perhaps it is hot in Washington, but not so hot or so menacing to health as life in the worst slums of our great cities."

Recent City Manager Appointments

O. M. Lanham, City Manager of Rome, Ga., from 1933 to 1937, has been appointed first City Manager of Moultrie, Ga. He took office July 15.

Leicester W. O'Connor succeeds Frank W. Haines as City Manager of Dexter, Maine.

CLARENCE E. RIDLEY,
Director, International City Managers' Association.

Tax Work Speeded 50 Per Cent

Comments from Two Officials of the Township of Union, N. J.

Valuations Ready Three Months Sooner

The town of Union, N. J., has been growing so rapidly, during the last twelve years especially, that we simply had to install modern office equipment or hire more help than we could afford.

Incorporated as a municipality in 1808, the township of Union slumbered along as a farming community while large cities grew up around us. Workers from these cities found Union a convenient home town, so that population tripled during the ten years 1924-29, was 16,445 in 1930, and now totals 20,000. There are 13,000 parcels. As an indication of real-estate activity, a plat in the center of town was broken into 32 subdivisions for the next appraisal.

Even four years ago the job of bookkeeping was becoming chaotic, so we purchased a Burroughs bookkeeping machine. Then, in 1935, an Addressograph was installed.

All tax work theretofore had been performed by hand. The Assessor did, and still does, all the field work, beginning the second week of August, and, before the advent of the machines, completing it in the second week of December. Meanwhile, he would have to spend half his time in the office in checking the work. The book was turned over to the County Tax Board on January 10, as the state law prescribes. Now, having available the accuracy and speed of the addressing machine, the field work is finished by the third week in October. Beginning October 15, the book is run off on the Addressograph in four days, and it is finished November 15. The figures include land value, improvement, personal valuation, household furnishings' exemption of $100, veterans' exemption of $500, total net value.

An important incidental advantage thus gained is that the Assessor can furnish the Tax Collector with the new valuations in time for them to be used in making the bills for the first two quarters of the next year, which are sent out December 1. Under the old system, these valuations were not ready in time. Also, under the old system, no change in ownership taking place after the book was started in August could be included, as they can under the machine system.

After the County Tax Board strikes the tax rate, the book is returned to the Assessor, who sets up the rate in the bookkeeping machine, and the total tax is inserted for each item. By hand it took a month to do this; it now requires three days. The book or tax roll is turned over to the Collector in April. Without the addressing machine, the Assessor would have required three typists instead of one.

ROY E. KITCHELL,
Former Secretary, Board of Assessors.

Old and New Billing, Posting, Addressing

Under the old system we received the tax duplicate each year as typed by the Assessor. Then we would have to typewrite all the bills; and all special assessment bills, some twelve or thirteen thousand per year, had to be made out the same way.

To determine the debt against any property, if it could be done at all without formal search, it was necessary to look through a number of tax duplicates of previous years and through from one to ten special assessment ledgers. Meanwhile, the taxpayers would wait two or three hours or come back later. Now it can be done in fifteen minutes.

In preparing tax searches, which cost $2 and consumed anywhere from three hours to two days, it was necessary to go through the tax duplicates for twenty years. A search now takes half an hour, and this eventually will be reduced to ten minutes. To check searches, not only had this same performance to be gone through, but in addition it was necessary to refer to all the special-assessment ledgers. The same work was required once a year in the case of preparing tax sales, of which there are about 700 from a delinquent list of 2,500. Delinquents were dunned by hand. We had difficulty in finding right addresses.

The town was growing so rapidly and the hand methods involved so much detail that the work was becoming chaotic. A larger personnel would not have served here, because only a limited number could use the records at the same time. A new system was necessary.

The Burroughs machine is now used for tax-billing. Thus all calculations are made mechanically, speeding work and guaranteeing accuracy.

Payments are first recorded in the daily cash book and then posted to the proper tax or special-assessment ledger card. This one process is a noteworthy labor-saver, for it eliminates duplicate posting. The bookkeeper who formerly spent most of the day posting receipts from the cash book to the tax or assessment ledger accounts is now employed on other duties.

A Burroughs receipting machine gives taxpapers a check to the receipt for their payments. In addition to making out the tax duplicate, the Addressograph is used on the bill, on the sales list and sales notices, and on the certificate of tax sale. The saving effected is not only in the cost of additional typists, but in accuracy, neatness, and legibility.

The entire system, which has speeded up our work 50 per cent, has received a very favorable response from the taxpayers, and it is worth noting that the tax office is the one municipal office that universally is in contact with the public.

FRED WATSON,
Clerk, Tax Department, Union, N. J.

For greater traffic safety

The Hamilton County Patrol—one of Ohio's finest — Chas. B. Coddington, Supt., and Sheriff Geo. Lutz; with their Harley-Davidson equipment.

use HARLEY-DAVIDSON Motorcycles

Cincinnati's famous *Hamilton County Patrol,* like so many others the nation over, rides on Harley-Davidson Radio-equipped Motorcycles. The smooth, trouble-free operation of the Harley-Davidson Radio equipment has drawn special praise from Sheriff George Lutz.

No single factor in the nation's great battle against crime and traffic violators has been more important than the superb performance of Harley-Davidson motorcycles. In actual service over many years they have proved themselves the king of all motorcycles. . . . Phone the Harley-Davidson Dealer near you. Ask him to bring over one of the new 1937 models for your inspection. It has highly desirable features and advantages which cannot be found in any other make. Or write us for literature describing the great Harley-Davidson line.

Harley-Davidson Motor Co., *Dept. M,* Milwaukee, Wisconsin

HARLEY-DAVIDSON
The Police Motorcycle

Traffic Control and Facilitation

Conducted by Publications Committee, Institute of Traffic Engineers, 1 Park Ave., New York

Paul L. Green, Chairman; John T. Gibala, Vice-Chairman; William C. Brandes, Otto K. Jelinik, Burton W. Marsh, William R. McConochie, E. J. McIlraith, Donald M. McNeil, D. Grant Mickle, Robert A. Mitchell, P. Taylor, Rayburn Hoffman

Get Behind Driver Education in the High Schools

That is the place to start to make American citizens conscious of the fact that this is a nation of fast-moving vehicles

By BURTON W. MARSH

Director, Safety and Traffic Engineering Department, American Automobile Association, Washington, D. C.

EDUCATORS increasingly urge that expert driving plus a practical knowledge of traffic safety be taught in the high schools. Not all boys and girls will become automobile drivers; but all are pedestrians and thus subject to the laws and menaces of the streets. Many will become mayors, police officers, judges, and all will become voters. Sound traffic instruction of the young should develop a generation of automotive-minded people.

The place to start is in the community, where the schools are. The mayor, the council, the police and fire chiefs, as well as the board of education and the traffic engineer, need to get behind the idea of traffic and driving instruction in the schools. It is now operative in some 5,000 high schools in about half of the states.

Objectives

What are the objectives of a sound program in high schools? Educators have indicated that the program must do the following four things:

1. Produce an understanding of the physical, mental and emotional characteristics which affect a driver or a person afoot. Individuals should also be informed of any such deficiencies which they may have, and should know what can be done about them. Generally, corrections can be made, or the person can compensate while driving or walking for incorrectable deficiencies.

2. Provide *knowledge* of sound driving and walking practices.

3. These sound practices must be developed into *habits* and *skills*.

4. Proper *attitudes* must be developed so that the individual will accept his responsibilities to use streets and highways fairly and wisely, and so that he will support progressive programs of highway development, traffic engineering, legislation, enforcement and education.

How Attained?

Obviously, an occasional talk or motion picture on traffic will not suffice. There must be a well-organized program involving the proper use of:

1. Testing devices to detect any physical, mental and emotional deficiencies which affect driving.

2. A suitable textbook. Two have been prepared and are being widely used —"Sportsmanlike Driving," by the American Automobile Association, and "Man and the Motor Car," by the National Conservation Bureau.

3. Validated tests to indicate the progress which has been made through textbook study, class discussions, "learn-by-doing" projects, and reading of reference materials.

4. Demonstration and instruction in a car by a trained instructor.

It is obvious that best results will be obtained by teachers who are specially trained. Two experienced educators on the AAA staff, Prof. Amos E. Neyhart, and Dr. F. R. Noffsinger, have therefore been devoting much of their time to training teachers. Summer session courses were offered this year at twelve colleges and four Indian Service Schools:

University of Alabama, University, Ala.
University of South Carolina, Columbia, S. C.
A. & M. College of Texas, College Station, Texas
University of Kentucky, Lexington, Ky.
State College of Washington, Pullman, Wash.
Kent State University, Kent, Ohio
University of Maryland, College Park, Md.
Pennsylvania State College, State College, Pa.
Rutgers Unviersity, New Brunswick, N. J.
Ohio State University, Columbus, Ohio
Springfield College, Springfield, Mass.
Texas Technological College, Lubbock, Texas

Individual instruction has also been given to teachers in several cities, including Birmingham, Ala., and Portland, Maine.

City Officials Can Help

City officials will recognize that their jobs will be easier and that they will be able to accomplish more of their traffic objectives with trained drivers and pedestrians, and with the *public support* which it is a main objective of the AAA program to develop. How can you help?

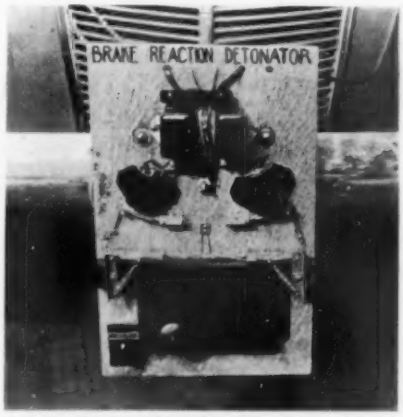
A suitable place for learning and practice is very important. The city engineer can help select a suitable little-used street or off-street space and can show ingenuity in the development of such a space to provide essential features without excessive cost. Drawings and descriptive data concerning either type of learning-place will be furnished by AAA Clubs or the American Automobile Association.

Police officials can be effective in showing classes their accident spot map and demonstrating in a "staged" accident how accident investigation is carried out.

Teachers and students will want up-to-date local information on accidents and their causes, major traffic regulations, both state and local, pedestrian problems, highway construction and maintenance methods and costs. A popular demonstration would prove how poorly we see pedestrians at night.

Mayors, city managers, and other municipal officials can easily devise ways of participating in the inauguration of such modern courses and in giving special recognition to students successfully completing them.

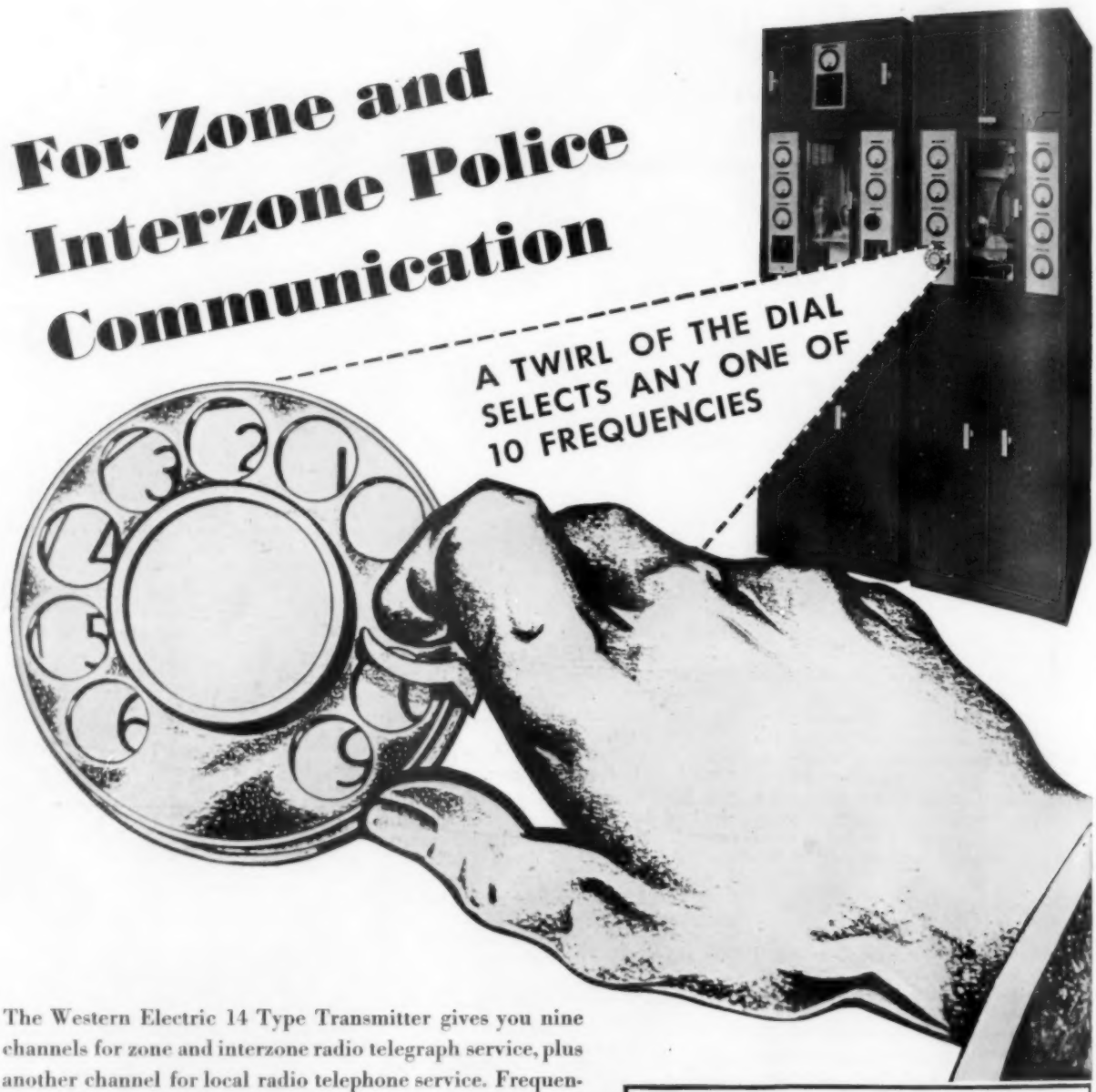
MARKINGS ON LEARNERS' STREETS



THIS DEVICE MEASURES BRAKE REACTION TIME AND BRAKING DISTANCE

An observer sits beside the driver. When the proper speed (say, 20 mph) has been reached and the way ahead is clear, the observer presses a button which fires one of two blank cartridges. The "blank" forces a capsule full of red enamel or paint onto the pavement. When the driver gets the brake into action, the other cartridge is fired and another red spot is made on the pavement. The distance between these two spots is the brake reaction distance for that speed. The distance from the second red spot to the detonator when the car is stopped, gives the braking distance for that speed. This is an AAA invention of Earl Allgaier in charge of driver testing.

For Zone and Interzone Police Communication



The Western Electric 14 Type Transmitter gives you nine channels for zone and interzone radio telegraph service, plus another channel for local radio telephone service. Frequencies are selected instantly by dialing. Power output is 500 watts telegraph—400 watts telephone.

Like the many other types of Western Electric equipment—to meet varying police requirements of states, counties, cities and small towns—the 14 type has proved its 24 hour-a-day dependability in actual service.

For full details: Graybar Electric Co., Graybar Building, New York—or Graybar's nearest branch.

FEATURES:

Frequency Range: Preadjustment to any 10 frequencies in range of 2 to 18.1 megacycles.

Frequency Stability: Within 0.025% of assigned frequency.

Quarts Plate: Low temperature coefficient quartz plates which do not require heater circuit.

Remote Control: Remote frequency selection and starting and stopping.

Monitoring: Aural monitoring of transmitter output and visual indication of percentage modulation.

Distributed by GRAYBAR

Western Electric

Distributed by GRAYBAR Electric Co. In Canada: Northern Electric Co., Ltd.

POLICE RADIO TELEPHONE EQUIPMENT

Cleveland Traffic Committee Reports

WHAT can be done to so mark and illuminate permanent safety zones that they will not constitute an abnormal night hazard?

Analysis shows that over 95 per cent of the fatal and serious collisions with permanent safety zones have occurred at night.

The subcommittee recommends a more effective style of buttress painting, more frequent washings and paintings of the buttresses and stanchions, more frequent cleanings of the lights and replacements of the bulbs, and a markedly improved method of buttress floodlighting along with improvements in the design of the buttresses.

Street-Sign Legibility

The subcommittee recommends the use of street-name signs having larger letters of a more legible type. These should be installed at such horizontal and vertical angles that they are illuminated by nearby street lamps.

In the employment of STOP, SLOW, WARNING, and stated-speed signs, the subcommittee recommends standardization. In many cases speed studies are needed to determine the proper sign to be used at a given point. For such studies we have obtained from the Radio Corporation of America an experimental photocell device which automatically records the speed of passing traffic in various speed groups. This device is now available for the use of city traffic engineers for the various types of speed studies pertinent to this work.

Traffic Signals and Control System

The subcommittee recommends more frequent cleanings of the traffic-signal lenses and reflectors, regular replacements of the lamp bulbs, and the use of lamp bulbs of proper voltage rating. Smoother traffic flow and greater safety can undoubtedly be obtained by changes in the traffic-control system and in the type of signal. These are matters requiring careful study by the traffic engineers.

Recommended Procedure

When the Cleveland Traffic Committee was organized, the city had no traffic engineer, and it was important that traffic-engineering activities be included in order that the safety program might be comprehensive. We have undertaken to pinch-hit in this traffic-engineering work.

Cleveland now has two capable traffic engineers. These engineers are rather directly responsible for the activities originally assigned to our subcommittee. The initiation and direction of such activities now properly belong to them.

After consultation with Vurnon Johnson, we recommend that our subcommittee be regarded as an advisory group. The city traffic engineers may call upon us at any time, individually or collectively, for consultation and for such assistance as we can render in the laboratory and in the field. This plan of organization is patterned closely after that which has proved so successful in reducing traffic accidents in Milwaukee and elsewhere. We believe it will prove equally effective in Greater Cleveland.

KIRK M. REID,
Chairman, Subcommittee on Lighting, Traffic Signals and Signs.

—Presented to the Executive Committee of the Cleveland Safety Council on June 8, 1937.

Auto Industry Grants $35,000 for Police Safety

A GRANT of $35,000 to be spent this year in promoting automobile accident prevention activities among American police departments has been made to the Safety Division of the International Association of Chiefs of Police, 1827 Orrington Avenue, Evanston, Ill., by the Automotive Safety Foundation, New York, according to an announcement by Lieut. F. M. Kreml, Director of the police organization. The grant represents more than a 100 per cent increase over the sum of $17,000 which was provided the organization by the Foundation for the previous year.

CENTER PARKING?

Suggestions have been made in some quarters that the removal of car tracks and attendant loading zones in congested business areas of some of our cities offers an opportunity for utilization of the center of the street for parking purposes. Apparently there exists a difference of opinion on this point. What do The American City readers think of center parking? Let's have *your* opinion.

Please address Editorial Department, The American City, 470 Fourth Avenue, New York.

Teach Traffic to Engineers

THE Committee on Traffic Control of the American Public Works Association is undertaking the project of having municipalities, counties and states designate a specific engineer to whom all traffic engineering problems will be referred. City, county or state engineers are invited to select an assistant engineer, get necessary approvals, and make it known that John Doe is to handle traffic engineering matters.

How can such an engineer obtain specialized training? President Thomas Buckley has authorized the Association to cooperate in a course in Traffic Engineering being sponsored at Harvard University August 16 to 28 by the Harvard Bureau for Street Traffic Research and the Institute of Traffic Engineers. Tuition, $10. Men can live inexpensively in dormitory rooms.

BURTON W. MARSH,
Chairman, Committee on Traffic Control, American Public Works Association.

Flash Units on Safety Zones

THE city of Detroit has recently purchased 49 flashing units for installation on the modern-type safety zone on some of the principal thoroughfares of Detroit. There are two amber lights with one double-contact flasher at the end of the zone facing oncoming traffic. The lights operate 24 hours a day. This lights the zone sufficiently to acquaint the approaching driver with the nature of the obstacle, but other than that is not intended to function as a piece of signal equipment, as is the case with our signal lights.

MODERN SAFETY ZONES IN DETROIT

Top—Rear view, showing plow-point construction and the two amber blinker lights with a red reflector lens below them. Bottom—Raised platform and protective side metal enclosure

The island is built of eight one-beam posts placed at 11-foot intervals, making a zone 88 feet long. The plow point is 6 feet long, giving an overall length of 94 feet, which is the standard length adopted by this city for safety zones.

HEINRICH A. PICKERT,
Commissioner, Police Department, Detroit, Mich.

Fellowships for Policemen

FROM eight to twelve fellowships, carrying stipends ranging from $500 to $1,000, will enable policemen in active service to study problems in street traffic control and automobile accident prevention at the Northwestern University Traffic Safety Institute, Oct. 18, 1937-June, 1938.

This has been made possible by a grant of $10,000 by the Lumbermen's Mutual Casualty Co. and the American Motorists Insurance Co., co-sponsors of the Kemper Foundation for Traffic Police Training, to enable a picked group of policemen to devote eight months to the study of automobile traffic particularly from the point of view of public safety. The Fellows will be selected on the basis of competitive examinations given to all applicants. Address the Director, Lieut. F. M. Kreml, of the Evanston, Ill., Police Department.

PREVENTION

of Traffic Accidents is More Important Than Punishment!

BENDIX IS PLEDGED TO SAFETY

PUNISHMENT of traffic offenders is necessary but not enough. It won't repair property damage nor restore lost life. The problem of traffic safety is primarily one of prevention.

Properly handled, municipal car-testing cuts down street accidents swiftly and sharply. Bendix, pioneer sponsor of "Street Safety by Prevention", has painstakingly developed and manufactures the machinery to do this work. Most modern car factories use it for final new-car tests. It is positively and consistently accurate. It is very fast. It is simple. It is very sturdy. It is reasonable in price. Very little training is needed to use it expertly. It is called Bendix Civic Safety Clinic Equipment.

This machinery enables a small staff of men to test a car a minute on each Safety Line. It tests brakes, steering, headlights, wheel alignment and as much in addition as you care to check.

Miami, Omaha, Portland, Billings, Knoxville—have recently installed Bendix equipment. We suggest you communicate with them, and write to Bendix for full details.

LEFT: *Tests each brake separately—by full wheel revolution under electric power . . . shows total stopping ability . . . shows up "out-of-round" drums. TESTS TRACTOR AND TRAILER TRAINS accurately.*

RIGHT: *Tests wheel alignment, caster, camber, toe-in, entire steering geometry, precisely and quickly. Shows exactly what work needs to be done. Nothing left to guesswork.*

BENDIX

CIVIC SAFETY CLINIC Equipment

BENDIX PRODUCTS CORPORATION
(Subsidiary of Bendix Aviation Corporation)
450 Bendix Drive, South Bend, Ind.

Send me at once full details about Civic Safety Clinic Equipment, prices, operating plan, etc.

Name .....
Address .....
City ..... State .....
Business or Profession .....
City Official (title) ☐ ..... Dealer ☐

Improving Municipal Administration

Current Items from the Public Administration Clearing House

States Act to Outlaw Drunken Drivers

A CONCERTED movement is under way among the states and cities to end "murder in the streets" by drunken drivers, through stricter legislation. More than a dozen states in 1937 sessions passed drivers' license measures or traffic regulatory acts, most of which contained penalties for drunken driving, and several others strengthened and extended previous laws, according to the Council of State Governments.

In Illinois, where a drivers' license law failed of passage but a provision for punishing reckless or drunken driving was approved, motorists convicted of drunkenness at the wheel now run the risk of losing driving privileges for a whole year. Any court of record can apply the penalty. Judge Charles S. Dougherty, in Chicago's Safety Court, launched enforcement by sentencing five erratic drivers to the county jail.

The new law of Kansas is more strict: licenses *must* be revoked in cases where the automobile operator has been convicted of driving while drunk or under the influence of narcotics. Indiana passed a similar law in 1937. Nebraska and Texas have established stiff penalties for violation of laws prohibiting driving while intoxicated, Texas making imprisonment mandatory.

Other states passing standard drivers' license measures this year were Arkansas, Maine, Michigan, New Mexico, Oklahoma and Tennessee.

Outlawing drunken driving is only one step toward eliminating the evil, the Council of State Governments points out. Definition of a drunken driver and systematic presentation of proof of his condition is equally important.

Several state courts have established definitions of a drunken driver. Massachusetts courts, for example, have held that proof of complete drunkenness is not necessary to convict, but merely that drinking has influenced the suspect perceptibly. New York's Supreme Court defines an intoxicated person as one who has imbibed enough liquor "to render him incapable of giving that attention and care to the operation of his automobile that a man of prudence and reasonable intelligence would give under like circumstances." In New York State, if a drunken driver is acquitted by a jury, his case may be referred to the State Bureau of Motor Vehicles. If the Bureau finds him guilty, his license may be revoked, despite the jury's decision. Two convictions of driving while intoxicated brings prosecution for a felony. Where injury or death results, the driver is barred permanently from securing a driver's license.

Special examinations have been devised by some police departments to present objective evidence of driving while drunk, which is also prohibited by many city ordinances. Test of the eye-pupils, blood analysis, pulse and temperature checks, help determine whether the suspect was drunk or ill when picked up. In some cases photographs of the jovial tippler have been taken, with his consent, usually bringing undeniable proof to the court-room. In other instances policemen attempt to engage the suspect in conversation in the presence of witnesses, and record is made of his answers to various questions, frequently proving his inability to reason coherently.

Joint City-County Buildings Found Successful

MERGER of city hall and county courthouse is saving money for a number of municipalities in the county. Joint occupancy by city and county of a central public building that may include courts, jails, all the city and county offices and other official headquarters is reported as successful in a dozen cases queried by the American Municipal Association. (See page 115, this issue.)

Minneapolis, Minn., and Hennepin County; Seattle, Wash., and King County; St. Paul, Minn., and Ramsey County; Salt Lake City and Salt Lake County; Camden and Camden County, N. J.; Fort Smith, Ark.; Pittsburg, Kans., Selma, Ala., and their respective counties were among contributors of information. Their various combined populations range from 20,000 to 535,000.

One of the city-county buildings—Salt Lake's—dates back to 1891, but most of them are of more recent date, and those in Selma, Ala., and Fort Smith are still under construction. Cost of their construction ranges from $35,000 to $10,000,000, the most elaborate building being for Camden City and County. The joint headquarters in Minneapolis, St. Paul and Seattle cost over $3,000,000 each.

Minneapolis' city-county building is managed by the Municipal Building Commission; St. Paul's by a special commission of four city officials and three county officials. Maintenance and operation costs, in three of seven cases reporting, are calculated separately for each agency.

In addition to housing the usual official city and county business offices, some of the city-county buildings surveyed have among their tenants the state labor bureau, Red Cross and reemployment bureau office, the school superintendent, chamber of commerce, and relief agencies. Other uses include auditorium, National Guard headquarters, American Legion club-room, gymnasium, athletic tournament floor and convention room.

New Fashions Turn Up in Police Radio

THERE are always new turns and tricks to make police radio more effective in the business of catching criminals. Quincy, Mass., has one of the newest—a "ouija board" of radio control to keep the central police station informed of the location of cruising radio cars every minute of the day and night, according to the *Police Chiefs' News Letter*, official bulletin of the International Association of Chiefs of Police.

Designed and constructed by Sergt. John P. Duffy, superintendent of the local police radio system, and his assistant, the "ouija" is a large, composition board map of the city of Quincy, divided into nineteen sectors, each one of which has a small white light with a number painted on its face. Every sector has nine smaller colored lights also, designating the force's eight radio cars and one patrol wagon, which are equipped with two-way radios. Each of the various colored lights is related to a certain car—red for No. 1, green for No. 6, blue for patrol-wagon, etc. The cars keep in constant touch with the radio operator, and whenever one goes from one sector to another on call, he indicates the position change by means of a dial on his desk. In addition, twelve large lights indicate strategic blocking points in the city where a patrol car can block off an entire section.

Kansas City (Mo.) police use a short-wave radio and a stop watch to apprehend speeders, especially those drivers who always slow down at sight of a motorcycle officer in their rear-view mirror. A police car with a sending set observes traffic. When a car is spotted traveling at too-high speed, the officer broadcasts: "Stand by for a 1936 Buick coach, black. Ready . . . Check!" At the last word another officer 770 feet ahead presses his stop watch; when the marked car passes him, he presses it again, and if it is found that the car traveled the 770-foot stretch in as little as 11 seconds, the driver is arrested for exceeding the speed limit at 50 miles an hour. Figures on the test chart indicate that to cover 770 feet in 10 seconds, a car must travel 52 miles an hour; in 12 seconds, 44 miles; and in 15 seconds, 35.

The legality of using radio information in making an arrest was questioned recently in Texas by a local police department. Referred to other states, the question brought the answer from Michigan that in the opinion of the Attorney-General an arrest made on radioed information was legal, so long as an officer acted on information coming to him from a broadcast by any regular police radio station.

Indian-equipped Louisiana State Police

Modern "INDIANS" *in modern* LOUISIANA

Write today for "Pride of the Force" with pictures and specifications of the new Indian "Police Specials" and proof of Indian's economy in police service.

Traffic regulation on the fine, new Louisiana road system is a major function of the smart, alert Louisiana State Police. This fast-growing force—completely equipped with Indian Motocycles—is famous for its highway patrol work as well as for its other law enforcement activities. Indian equipment contributes greatly to the high efficiency of this force.

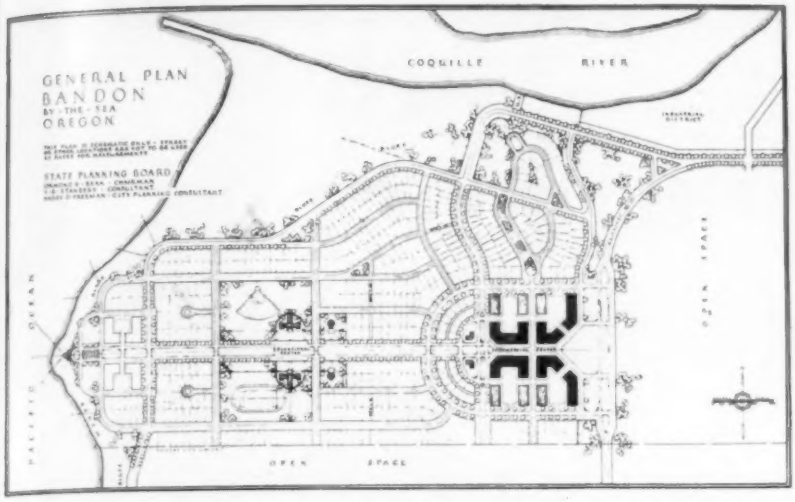
The new Indian "Police Specials" represent the highest achievement in machines specially designed for patrol work and traffic regulation. They are dependable, safe and decidedly economical—with many outstanding features, among them dry sump oiling and leaf spring front fork.

Indian

MOTOCYCLES

INDIAN MOTOCYCLE COMPANY, DEPT. AC-8, SPRINGFIELD, MASS.

Rebuilding of Oregon City Lends Opportunity for Modern Plan



SOMETHING new in the way of city planning is proceeding in Oregon. It is the entire reconstruction of the town of Bandon-by-the-Sea along modern city planning lines. This little industrial town, population 1,500, burned to the ground in a forest fire not quite a year ago.

Described in a special bulletin issued July 12 by the American Society of Planning Officials, the rise of a new, planned-in-advance Bandon will rest upon the united action of property owners in pooling all of their land for the community. The cooperative property pool has been effected, and the completion of financial arrangements, now under way, will see the start of construction.

The first step toward reconstruction of Bandon after the disastrous fire was taken when Governor Charles H. Martin of Oregon asked Chairman Ormond R. Bean of the Oregon State Planning Board to offer local officials the assistance of the Board. A number of business and professional men who had previously proposed relocating the business district on a site more easily accessible from the residential areas and the coastal highway supported the Board's recommendation to build a well-designed, modern city of modest proportions on a new site within the old boundaries.

The property pool, formed within six months after the fire had destroyed $3,000,000 worth of Bandon property—practically all of it—brought local landholders under an agreement that gave clear title to a special holding corporation or trustee, the Coos Bay National Bank. The agreement authorized a Citizens' Rebuilding Commission to place a valuation on each lot included in the pool on the basis of the 1936 appraisal, and to negotiate with the Coos County Court for the purchase or exchange of any county-owned parcels of property within the city or immediately adjacent to it. Later, when the final plans for the new town are completed, the Commission will reallocate the land, giving to each property owner parcels of property equivalent in value to what he contributed to the pool.

The main site of the new Bandon will lie within the limits of the burned city, on high land overlooking the Pacific Ocean on the west and the Coquille River on the north. For the new town a developed area of only 450 acres, as contrasted with 905 acres in the old town, is needed to provide adequate residential, business and industrial districts, park and school sites, a resort section, and the street system. To protect the city from the waste of land and money proceeding from excess subdivision platting, and to provide reserves for future expansion, a belt of undeveloped land, zoned partly for agriculture, is to adjoin the city on the south and east.

The business center, the civic center, the educational and recreational group and the resort area are located at various points along a straight, wide central boulevard running east and west. The business district is relocated to provide adequate and safe traffic access to the rest of the city and to the main highway. Parking areas in the business district are located in the interior of business blocks. Nearby space is set aside for filling stations, garages and light manufacturing establishments of a type not objectionable to adjoining retail stores or residential areas. On "main street" frontage is available for drugstores, groceries, banks, hotels and the like. Transition from the business district to the residential area is to be accomplished by means of a civic center for public and semi-public buildings. An educational center is located on the central boulevard between the business district and the oceanside resort.

A definite use for each street is contemplated in the street pattern that has been laid out. The business district is surrounded by a belt boulevard that connects with the main highway. Width of the minor streets, in residential sections, will be determined by the use to which they will be put. Blocks are longer and fewer in number than in the old town.

Bandon's program, points out the ASPO bulletin, is an object lesson in the effective collaboration of state and local planners with municipal officials and a community of citizens toward the development of a town planned for modern living.

The Municipal Bond Market

THE exceptionally healthy tone of the municipal bond market is reflected in the following comment which appeared in the financial section of *The New York Times* for July 29:

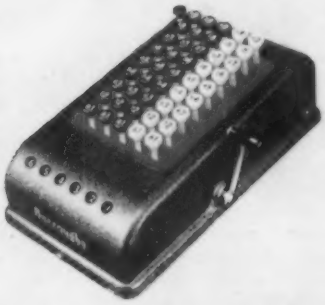
"An unusually broad inquiry and persistent demand for the better grade state and municipal bonds for this time of year is reported by important factions in the municipal bond field. Several factors, it is contended, contribute to this unseasonal activity, foremost among which is the scarcity of new issues of the most desirable names and maturity. It is, however, emphasized that leading institutional buyers, normally the most important outlet for most tax-exempt issues, virtually ceased their buying activities during the rather drastic downward readjustment in municipals early this year. It was not until after values leveled off and the trend was reversed in April that the institutional demand began to reappear in any volume. The current interest, which has been sufficient to hold the price structure of the municipal bond market remarkably firm, is attributed in part to belated institutional buying to meet portfolio requirements. From a 3.15 per cent yield basis in April, the market for the better grade tax-exempts has advanced to a point where the average yield is again below the 3 per cent level."

Recent sales of new issues from July numbers of *The Bond Buyer:*

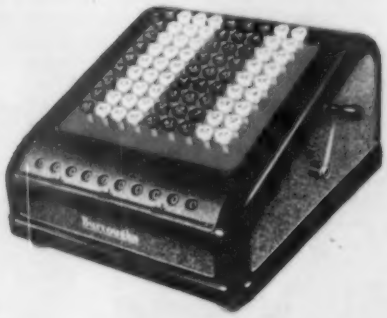
Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$1,500,000	Cincinnati, Ohio, Notes	1.25	1.5 Avg.	1.24
100,000	Quincy, Mass., Relief	1.75	1-5 Ser.	1.58
125,000	Newport, R. I., Police Sta., Highway and Drainage	2	8.25 Avg.	1.91
225,000	Niagara Falls, N. Y., Sewage Disposal Plant, Series B	2	1-15 Ser.	2
700,000	Bridgeport, Conn., Refunding	2.25	5.85	2.07
1,500,000	Richmond, Va., Public Improvement	3	1-20 Ser.	2.20
400,000	Wilkes-Barre, Pa., Improvement	2.5	14.33 Avg.	2.45
127,000	Tulare Co., Calif., School	3	11.85 Avg.	2.95
300,000	Shreveport, La., Street Improvement	3	5.75	2.99
127,000	Arlington Co., Va., Sewer	4	27 Avg.	3.31
625,000	Eureka, Calif., Water	4	16.5 Avg.	3.37
760,000	Hudson Co., N. J., Hospital	4	19 Avg.	3.43
144,000	Hammonton, N. J., Refunding	4	8.16 Avg.	4
207,000	Johnstown, Pa., Redemption	4.25	10 Avg.	4.14
107,000	Hillside Tp., N. J., Trunk Sewer	4	8.5 Avg.	4.26
192,500	Elk City, Okla., Water Works	4	11.33 Avg.	4.82

Burroughs

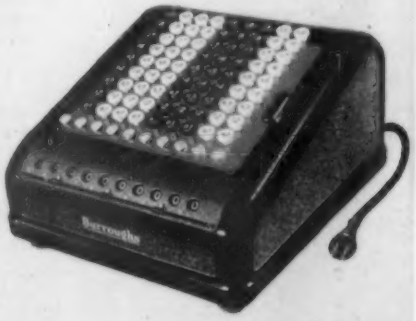
NEW FEATURES *in the* ENTIRE LINE OF BURROUGHS CALCULATORS



A small six-column calculator for handling small amounts. It assures low equipment costs where a machine of larger capacity is not required.



The many styles of Burroughs Calculators include machines of six, ten and fourteen column totaling capacities, fractional keyboards, electric or hand operation.



Burroughs Electric Calculator with Simplified Subtraction. New speed, new quiet operation, new style. Ten and fourteen column capacities.

new

ELECTRIC DUPLEX CALCULATOR

TWO TOTALS

The individual totals in the front dials are transferred electrically to the rear dials where they accumulate into a grand total.

DIRECT SUBTRACTION

A mere touch of this key subtracts an amount directly from the grand total without the use of complements.

FAST . . . QUIET ELECTRIC

Provides a faster, simpler way to accumulate individual calculations into a grand total. Direct subtraction, fast electric transfer, electric clearance, and positive electric key touch speed up the work and enforce accuracy. Other Burroughs Calculators of various totaling capacities also have new features, new advantages and new styles; thus, you can select the one that will give you the shortest, simplest operation on your particular job. For a demonstration or complete information, telephone the local Burroughs office, or write—

BURROUGHS ADDING MACHINE COMPANY
6498 SECOND BOULEVARD, DETROIT, MICHIGAN

THERE'S A BURROUGHS CALCULATOR FOR EVERY TYPE OF CALCULATING

A 16-Year Record of Real Estate Assessments and Taxes, City of New York

FROM the 1936 Report of the Commissioners of Taxes and Assessments of the City of New York, published June 15, 1937, the accompanying tables have been compiled. As will be seen, the aggregate assessed value of the city's taxable real estate for 1936 was $16,678,765,548. Exempt real estate for the same year was valued at $4,663,424,784. This included U. S. Government property assessed at $210,146,700; state property, $86,262,030; city property, $3,482,648,120; other exempted property (charitable, religious, educational, etc.), $880,413,934; exempt housing, $945,000.

VACANT LAND, 1936

Borough	Total Parcels	Vacant Parcels	% Parcels Vacant	Assessment Vacant Parcels
Manhattan	77,169	2,704	3.5	$97,108,320
The Bronx	93,313	29,566	31.7	117,769,656
Brooklyn	293,697	29,750	10.0	117,587,405
Queens	275,351	73,890	26.8	227,135,960
Richmond	76,620	40,398	52.7	51,412,330
Total	816,150	176,308	21.6%	$611,013,671

Notes to the foregoing table

1—In the suburbs, vacant parcels are frequently acreage plots, hence the actual vacant area is greater than the foregoing figures indicate.
2—Every parcel which contains any improvement, however slight, is counted as improved.
3—Exempt and partially exempt parcels are included in the total, but not in the number of vacant parcels. Only taxable land is listed in the number of vacant parcels.

CLASSIFICATION OF BUILDINGS, 1936
(for City as a Whole)

Class	Total
One-family dwellings, designed as such, however used	306,740
Two-family dwellings	162,993
Tenements without elevators	128,836
Hotels and elevator apartment houses	6,460
Warehouses, loft buildings and department stores	11,050
Office buildings	1,449
Factories	7,073
Stables and garages	13,651
Theaters	563
Special structures	34,972
	673,787

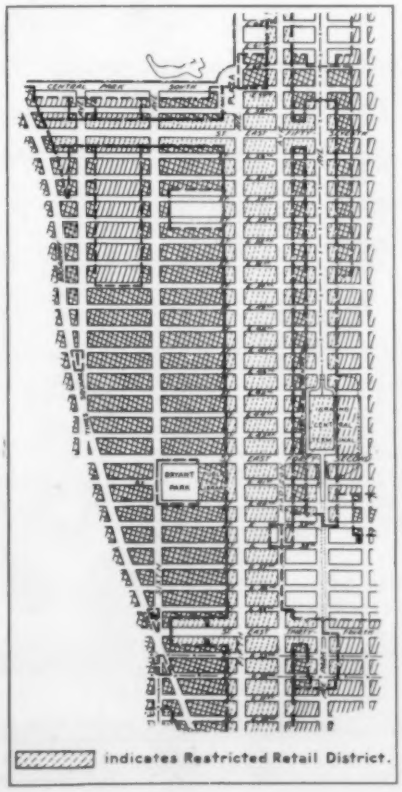
ASSESSED VALUES OF TAXABLE REAL ESTATE IN THE CITY OF NEW YORK

Year	Ordinary Real Estate Land	Ordinary Real Estate Improvements	Real Estate of Utility Corporations Land	Real Estate of Utility Corporations Improvements	Special Franchises	Total	TOTAL TAX LEVIED ON REAL ESTATE
1920	$4,606,220,298	$3,355,678,500	$116,600,530	$129,910,645	$417,712,584	$8,626,122,557	$215,904,822.78
1921	4,920,054,720	4,348,226,475	123,895,920	152,551,410	428,256,579	9,972,985,104	278,218,382.59
1922	4,976,001,082	4,565,004,738	123,936,694	158,552,206	426,500,910	10,249,995,630	282,458,373.48
1923	5,084,991,202	4,795,596,326	125,226,651	160,621,399	429,630,770	10,596,066,348	290,362,320.76
1924	5,311,656,896	5,129,444,898	131,355,705	147,789,245	428,559,749	11,148,806,493	306,047,936.43
1925	5,561,718,945	5,593,580,955	134,104,223	157,986,277	453,958,153	11,901,348,553	320,764,223.10
1926	6,068,631,739	6,141,377,853	144,670,575	167,396,725	475,503,943	12,997,580,835	353,507,662.36
1927	6,982,347,554	6,729,060,661	157,104,447	167,453,903	503,871,638	14,539,838,203	393,631,843.07
1928	7,329,557,109	7,469,467,386	168,017,589	177,944,511	500,662,304	15,845,648,899	433,153,268.82
1929	8,056,644,524	8,165,798,946	181,870,709	193,705,291	535,895,340	17,133,914,810	456,804,771.72
1930	8,731,788,851	8,516,516,366	196,466,564	194,343,136	564,413,855	18,203,528,772	487,383,058.29
1931	9,024,155,671	8,737,356,696	215,151,254	203,155,296	626,348,007	18,806,166,924	504,218,766.70
1932	9,010,560,261	9,514,153,156	214,158,776	205,344,374	672,698,862	19,616,915,429	526,200,360.91
1933	8,584,233,271	8,765,340,073	211,514,210	198,757,390	697,160,314	18,457,005,258	449,369,033.19
1934	7,790,692,841	8,271,691,477	210,303,155	184,482,295	692,056,789	17,149,226,557	472,531,483.35
1935	7,457,873,311	8,107,848,420	202,324,845	184,600,355	697,124,268	16,649,771,199	469,358,432.26
1936	7,316,914,341	7,551,714,565	248,382,940	866,419,435	695,334,267	16,678,765,548	453,527,010.86

Restricted Retail District Provides Improved Zoning

AN important advance in zoning technique, of special benefit to the Fifth Avenue Section of New York, has become effective through the adoption on June 4 of an amendment to the Building Zone Resolution of the city of New York, setting up a "Restricted Retail District."

In this new district, a part of which is shown on the accompanying map, the same regulations and restrictions apply as are provided for in ordinary retail districts, except that in the newly created district no building or premise shall be used, nor shall a building be located which is arranged, intended or designed to be used for any of the following purposes: theater or motion picture theater; open-air theater or motion picture theater; cabaret and public dance hall other than in clubs and hotels; bus stations; and business of selling automobiles on lots or plots unbuilt upon. The streets included in this new district are Fifth Avenue from 26th to 59th Streets, Madison Avenue from 23rd to 84th Streets, Park Avenue from 32nd to 34th Streets and from 39th to 58th Streets, 34th Street between Park and Seventh Avenues, 57th Street between Park Avenue and Broadway, and the side streets between 26th and 59th Streets from a point 100 feet west of Fifth Avenue to a point 100 feet east of Madison Avenue.



The adoption of the Restricted Retail District is a concrete example of the constructive work in city planning which may be carried on by property owners through the instrumentality of an organization such as The Fifth Avenue Association, which led in the movement for what has been hailed as one of the most advanced steps in New York zoning since the original adoption of zoning in 1916.

"It is my belief that through the adoption of this new zoning amendment," says Captain William J. Pedrick, President of The Fifth Avenue Association, "there is provided another protection for the city's 'tax gold mine,' as it must be borne in mind that the realty within what is commonly termed the 'Fifth Avenue Section' has an assessed valuation of more than $2,000,000,000 and thus the property owners in this area pay $55,000,000 in actual taxes, which means approximately 25 per cent of the taxes paid in the borough of Manhattan and approximately 12 per cent of the total taxes paid in the entire city of New York."

At a subsequent meeting of the Board of Estimate and Apportionment, June 25, territory was added at the request of the 34th Street Midtown, Broadway and Sixth Avenue Associations, to include the area between Broadway and Seventh Avenue between 30th and 36th Streets.

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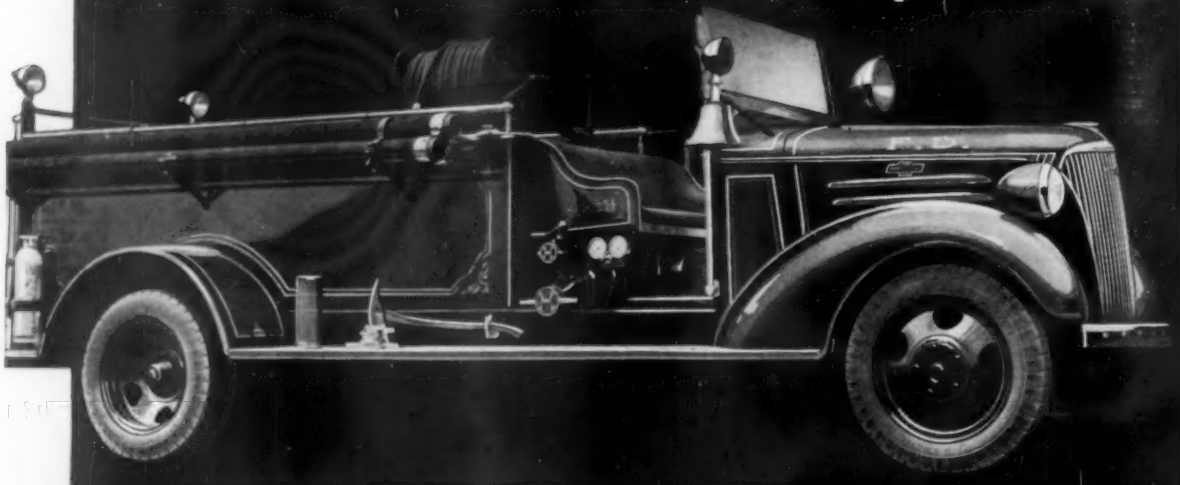
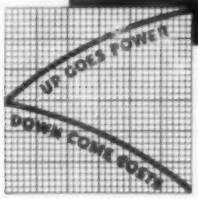
MOTOR UNITS FOR MUNICIPAL REQUIREMENTS



FIRE-FIGHTING EQUIPMENT



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Zoning and Planning Notes

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Author of "Zoning: The Laws, Administration and Court Decisions During the First Twenty Years"

Business District—Garage—Variance

NEW YORK.—*Matter of Fourteenth Street Warehouse Corporation* (Supreme Court, New York County) reported in *New York Law Journal*, May 12, 1937, page 2385.—The petitioner is the lessee of a building on the northeast corner of East 14th Street and Avenue B (and therefore between Avenues A and B) in New York City. The entrance to the building is wholly on Avenue B, except for a small emergency exit located on 14th Street. A public school is also located on 14th Street, between Avenues A and B, the entrance being on 14th Street.

The building is in a business district, in which, under the Zoning Resolution of the city of New York, a public garage for more than five motor vehicles is forbidden.

The building was formerly occupied as a car barn, and the petitioner seeks to convert it into a public garage for more than five motor vehicles. To that end he is applying to the Board of Standards and Appeals for a variance of the zoning resolution on the ground that practical difficulties and unnecessary hardships prevent a literal compliance on his part with the Zoning Resolution. He claims that his building cannot be used for business purposes; that a public garage for the storage of more than five cars is the only practical, available use to which the property can be put, and that he will be deprived of any beneficial or practical use of it unless his application is granted.

The Board of Standards and Appeals held that it was prohibited from granting the variance under Section 21 of the Zoning Resolution forbidding "a garage in the same block, between the same two intersecting streets, with a duly organized school for children under sixteen years of age. . . ."

And this Court upholds the decision of the Board of Standards and Appeals, saying in its decision:

> "This provision of the Building Zone Resolution was framed not alone to protect school children from the risk of cars passing into and out of garages, but also to avoid increases in traffic in the affected area, the presence of gas fumes, the existence of a fire hazard and the possibility of an explosion. The provision should receive a construction consonant with the beneficial purpose for which it was enacted; . . . being a remedial statute. . . . Whatever uncertainty there may exist in the meaning of this provision should be resolved in favor of the safety of school children, for whose protection it was enacted."

The fact that the garage has no entrance on 14th Street, on which the school is located, is immaterial. Immaterial, also, is the distance of the entrance to the garage from the school.

And the Board of Standards and Appeals could not exercise any discretion in a matter such as this but was compelled to deny the application for a variance; it being "clear that the Board of Estimate [which enacted this provision as an amendment to the Zoning Resolution] took into account the positive danger attendant upon school children going to and from school when within close proximity to garages and therefore removed entirely from the discretion of the Board of Standards and Appeals all power to vary the Resolution under any circumstances. While legitimate business should not be stifled or restricted by unnecessary hardships, such considerations must yield to the greater public interest involved in the maintenance of safeguards for school children."

EDITOR'S NOTE.—A decision in this case by the official referee appears in the *New York Law Journal* of May 11, 1937.

Zoning District—Single Lot

PENNSYLVANIA.—*Huebner v. Philadelphia Savings Fund Society*, 192 Atl. 139 (Supreme Court, May 3, 1937).—A single lot with a building thereon is not a proper area to be classified as a zoning district in itself; and the action of the City Council in creating a separate commercial zone of isolated area comprising a single corner lot is unreasonable and void.

Condemnation by the National Government for Slum Clearance

The right of the Alley Dwelling Authority to condemn land for the elimination of alley dwellings has been upheld by the United States District Court for the District of Columbia. This right, with evident justice, the Authority claims is essential to carrying out the purposes for which it was created.

John Ihlder, Executive Officer of the Authority, in commenting on the decision, emphasizes its importance in clearing the way of slum reclamation. The Act is permanent as distinguished from emergency legislation. Its purpose is to rid Washington of all its inhabited alleys—the characteristic slums of the Capital. These alleys are in many ways typical slums. The properties involved are in many kinds of ownership, among them estates with many heirs, absentee landlords, owners who have disappeared, parcels so small that they can be put to no useful purpose unless united with adjoining properties. This multifarious ownership gives constant opportunity for the owner of a single parcel to hold up redevelopment unless paid an exorbitant price. For many reasons, therefore, it is essential that this Authority have the right to condemn.

Mr. Ihlder also points out that the right to condemn is based not upon any proposed use of the property, after it is acquired, such as housing, but on the elimination of conditions that are inimical to public health, safety, morals and welfare. All other methods of dealing with these conditions have been tried over a long series of years, but the conditions remain. Private enterprise as a constructive force has retired, and government acquisition, replatting and redevelopment, is the only remaining method if the slums are not to continue as community liabilities.

In opposition to these proceedings it was urged that the purpose for which the property was to be acquired was not a public use, since after acquisition the Authority could manage the property, or could sell or lease it to private owners. The Government pointed out that these were merely auxiliary powers. The purpose of the Act is to rid the District of Columbia of inhabited alleys, and the public use is to rid certain areas of conditions that are prejudicial to the public health, safety, morals and welfare. After acquisition, the Government is free to make such use of its property as it deems wise.

It should be noted that this is not a case involving the right of public authorities to acquire land for housing purposes, or engage in housing enterprises. The right of the National Government to exercise this right has not as yet been adjudicated, although it was involved in the case of *United States of America v. Certain Lands in the City of Louisville*, 9 Fed. Sup. 137, 78 Fed. (2d) 684, withdrawn by the Government before final decision.

The right of municipal housing authorities to exercise the power of eminent domain for housing has been upheld in two cases—*New York City Housing Authority v. Muller et al*, 279 N. Y. Sup. 299, 155 Misc. 681; 270 N. Y. 333; and *Spahn v. Stewart et al, in Kentucky*.

Subdivision Control in Connecticut

With the aid of the Fairfield County Planning Association, Connecticut, by a statute recently passed, has secured an added measure of control over the subdivision of land. The law gives the towns, cities and boroughs of the state the right to confer upon planning commissions the power to require plats to be submitted to them before recording.

$1^{00} = $2^{75} = $412^{50} = $575^{00}

(or)

Pavement Maintenance Costs

at RICHMOND, VA.

East Main St., Richmond, is brick paved for 40 blocks through the heart of the city.

MAINTENANCE EXPENSE OF THE PRINCIPAL TYPES OF STREET PAVEMENTS, RICHMOND, VIRGINIA

From the Annual Report of the Director of Public Works for the Year 1936

Type	Total Sq. Yds.	Sq. Yds. Replaced	Total Cost	Unit Cost per Sq. Yd. for all Maintenance	Comparative Index
Vitrified Brick	**282,726**	**16**	**$23.47**	**$0.00008***	**1.00**
Pavement Type A	297,696	36	65.34	0.00022	2.75
Pavement Type B	1,237,256	33,487	40,505.67	0.033	412.50
Pavement Type C	180,984	3,951	8,383.54	0.046	575.00

*"Maintenance due to causes other than the failure of the Vitrified Brick."

● Of course, you've always known that of all the pavement types, brick is far less expensive to maintain. But how those official figures for Richmond, Va., give point and definite form to an old truth!

Brick maintenance for 1/575th of the maintenance cost of another well-known type is quite a lot of difference!

So. 2nd Street was brick paved last year.

Brick pavements are now in daily use after nearly 50 years of exposure to weather and traffic. With such a long life and such a low maintenance, brick is indeed the greatest of all paving values!

The reason for long life and low cost of brick pavement is due to the fact that it withstands weather as well as traffic. Changes in temperature and atmospheric moisture damage most pavements. Brick is more highly resistant to these natural causes of damage than any other type. In addition it is highly resistant to traffic damage.

Use vitrified brick on new jobs. Various types of old pavement may be easily resurfaced with brick. National Paving Brick Association (Affiliated with Structural Clay Products Institute), National Press Building, Washington, D. C.

BRICK

FOR NEW AND RESURFACE JOBS

The City's Legal Rights and Duties

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held not immune from liability for property damage due to breaking of water main if city's negligence caused damage (New York Court of Appeals: *Layer v. City of Buffalo*, 8 N. E. 2d, 307).

City held not liable for injury to motorist whose car collided at night with garbage truck that had no tail-light burning (Tennessee Supreme Court: *Boyd v. City of Knoxville*, 104 S. W. 2d, 419).

City held not liable for injury due to negligence of CWA workers in demolishing building on municipal fair grounds (Louisiana Supreme Court: *Todaro v. City of Shreveport*, 174 So. 111).

Evidence held insufficient to show that city was at fault in death of boy who drowned in a municipal swimming pool (Indiana Supreme Court: *City of Evansville v. Blue*, 8 N. E. 2d, 224).

Caddy held entitled to recover against city for injury due to defective bridge on municipal golf course (North Carolina Supreme Court: *Lowe v. City of Gastonia*, 191 S. E. 7).

Complaint against town held to state right to damages for injury to pedestrian who fell from an unguarded and unlighted bridge or culvert affording entrance to a park (New Jersey Supreme Court: *Cohen v. Town of Morristown*, 190 Atl. 851).

City held not liable for injury to motorist who collided with curbing at a point beyond a street intersection where there was an offset in the street line, although no warning against the condition was maintained by the city (California District Court of Appeal: *Robertson v. City of Long Beach*, 66 Pac. 2d, 167).

Statutory notice of claim against city for injury held fatally insufficient for failing to give claimant's street address for six months before accident (Washington Supreme Court: *Sopchak v. City of Tacoma*, 66 Pac. 2d 302).

Annexation

Annexation proceedings, void for non-compliance with statutory requirements, held validated by curative statute (Oklahoma Supreme Court: *Galyon v. Chickasha Milling Co.*, 67 Pac. 2d, 781).

Contracts

Sewer contractor's bond to indemnify city against liability held not to cover liability incurred by city under contract made with property owners without contractor's knowledge (Massachusetts Supreme Judicial Court: *Bryne v. City of Gloucester*, 8 N. E. 2d, 170).

Municipal requirement that supplies bought be manufactured by union labor held valid, but requirement that printed matter bear typographical union label held invalid as discriminating against lithographers, although city could award contract to printer, as against lithographer, in the exercise of good faith (New York Supreme Court, New York County: *Amalithone Realty Co. v. City of New York*, 295 N. Y. Supp. 423).

Under city's contract, engineers held entitled to pay on abandonment of sewer and water project after construction contracts were let (Texas Court of Civil Appeals: *City of Aransas Pass v. Hamon & Griffith*, 104 S. W. 2d, 893).

Double Office-Holding

Councilman held not qualified to act as street-improvement district commissioner (Arkansas Supreme Court: *Tappan v. Helena Federal Savings & Loan Assn.*, 104 S. W. 2d, 458).

Food Regulations

City held not entitled to impose municipal inspection of slaughterhouses outside city supplying meat within, unless state inspection was insufficient protection to consumers (California Supreme Court: *City of Oakland v. Brock*, 67 Pac. 2d, 344).

Fund Transfer

City held powerless to transfer water revenues to general revenue fund (Ohio Supreme Court: *City of Lakewood v. Rees*, 8 N. E. 2d, 250).

Garbage Removal

Statute imposing on first-class cities duty to remove garbage, to exclusion of private transportation, upheld (Indiana Supreme Court: *City of Indianapolis v. Ryan*, 7 N. E. 2d, 974).

Health Measures

Ordinance for delivery of unclaimed impounded animals to hospitals, etc., for scientific study in aid of prevention, etc., of human disease upheld (Illinois Appellate Court: *Illinois Anti-Vivisection Society v. City of Chicago*, 7 N. E. 2d, 379).

Licenses

Payer of invalid license tax under protest held entitled to recover amount paid (Florida Supreme Court: *City of Orlando v. Gill*, 174 So. 224). To same effect see *Barker Bros. v. City of Los Angeles*, 67 Pac. 2d, 729.

Ordinance imposing bond requirements, etc., on agents for non-resident dry cleaners held void as being unjustly discriminatory (Kansas City, Mo., Court of Appeals: *Beckenstein v. Moran*, 104 S. W. 2d, 404).

Junk-yard licensing ordinance held void so far as barring non-residents, but non-resident's remedy was a suit to compel issuance of license, and not by way of defense to a prosecution for operating without a license (New Jersey Supreme Court: *Lipkin v. Duffy*, 191 Atl. 288).

$300 annual license tax on broadcasting stations held void as burdening interstate commerce (Georgia Supreme Court: *City of Atlanta v. Southern Broadcasting Co.*, 190 S. E. 594).

Ordinance regulating retail coal sales, imposing license fee, requiring bond to secure against improper weighing and defective quality, etc., upheld (Maryland Court of Appeals: *Jacobs v. Mayor and City Council of Baltimore*, 191 Atl. 421).

Ordinance licensing and regulating plumbers upheld (Arizona Supreme Court: *Board of Examiners v. Marchese*, 66 Pac. 2d, 1035).

Municipal Utilities

Statute forbidding duplication of utilities held not to preclude city from establishing gas plant in competition with service furnished by electric plant twenty miles away (Florida Supreme Court: *State v. Plant City*, 173 So. 363).

Constitutional requirement for approval of municipal bond issues by electors held inapplicable to revenue certificates issued to improve electric plant (Florida Supreme Court: *Brooks v. City of Jacksonville*, 173 So. 365).

Proceedings by town for establishment of light plant held not invalid on ground that specifications of the plant were insufficient to support competitive bidding (Iowa Supreme Court: *Brutsche v. Incorporated Town of Coon Rapids*, 272 N. W. 624).

Statute allowing cities under 500,000 population to make water-works improvements, etc., as Federal aid projects, without referring question to electors, upheld (Illinois Supreme Court: *City of Mt. Olive v. Braje*, 7 N. E. 2d, 851).

Referendum proceedings for erection of municipal light, heat and power plant held void as debt limitation (New Jersey Supreme Court: *Public Service Electric & Gas Co. v. City of Camden*, 192 Atl. 222).

Although electric company's franchise reserved to borough right to establish competing plant, held that State Public Service Commission improperly permitted borough to establish plant, in absence of showing that it could profitably operate at lower rates (Pennsylvania Superior Court: *Metropolitan Edison Co. v. Public Service Commission*, 191 Atl. 678).

Official Bonds

City treasurer's bond to account for funds deposited in bank that failed held not vitiated by city's failure to comply with statute governing designation of depositories nor because bond exceeded statutory requirements (United States District Court, Northern District of Texas: *City of Dalhart v. Childers*, 18 Fed. Supp. 903).

Parks

City to which land was privately donated for park purposes held not empowered to use it for playgrounds (New York Supreme Court, Appellate Division: *Beth Israel Hospital Assn. v. Moses*, 294 N. Y. Supp. 1018). But a swimming pool may be installed in a park acquired by city by purchase or condemnation (South Dakota Supreme Court: *Lefevre v. Board of City Commissioners of City of Brookings*, 272 N. W. 795).

Police Measures

Ordinance forbidding transportation of more than 600 gallons of explosive oil by truck along streets upheld (Kansas Supreme Court: *Ash v. Gibson*, 67 Pac. 2d, 1101).

Ordinance banning cigarette-vending machines held valid means of curbing sales to minors (United States Circuit Court of Appeals, Seventh Circuit: *Illinois Cigarette Service Co. v. City of Chicago*, 89 Fed. 2d, 610).

Public Utilities

Attempt by city and gas company to increase rates above those fixed by arbitration under franchise held ineffectual as against consumers (United States Circuit Court of Appeals, Sixth Circuit: *Consumers Power Co. v. Krause*, 89 Fed. 2d, 565).

Town held to have pleaded right to mandatory injunction to compel electric company whose franchise had expired to remove its poles, etc., from the streets (Delaware Court of Chancery: *Town of Seaford v. Eastern Shore Public Service Co.*, 191 Atl. 892).

Sewers

Prescriptive right to continue use of ditch for sewage discharge held not to permit such use as to injuriously affect nearby property owner after means of flushing ditch failed (Mississippi Supreme Court: *City of West Point v. Womack*, 174 So. 241).

Special Assessments

Statute permitting payment of special assessments with street-improvement bonds held void as impairing rights of other bondholders not owning assessed property (Indiana Supreme Court: *Conter v. State*, 8 N. E. 2d, 75).

Streets

Long-permitted use of a strip across a railroad right-of-way as a street crossing held to amount to a dedication by the railroad company, precluding later obstruction (Georgia Supreme Court: *Atlantic Coast Line Railroad Co. v. Donalsonville Grain & Elevator Co.*, 191 S. E. 87).

Attempt to vacate street for private benefit held invalid (Florida Supreme Court: *Roney Investment Co. v. City of Miami Beach*, 174 So. 26).

Abutter held entitled to damages resulting from paving street to original width after he had made improvements within the street limits at city's request (Texas Court of Civil Appeals: *City of San Angelo v. Neilon*, 104 S. W. 2d, 895).

Taxation

That judgment was based on contractual debt held not to require city to levy tax exceeding constitutional maximum rate (Kentucky Court of Appeals: *James C. Willson & Co. v. City of Ravenna*, 104 S. W. 2d, 965).

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The value of moisture in traffic-bound road surfaces is shown by the comparison of roads above. Containing proper proportions of gravel, sand and clay, roads may still be good or bad—varying with the moisture content.

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To attain greater compaction of the road surface and provide a reservoir for the calcium chloride, many road departments accomplish a partial stabilization by adding a small amount of clay to gravel roads. In making possible a high degree of compaction, this procedure also conserves road materials and increases the efficiency of calcium chloride.

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Cost of Government

Cost of Government in the United States, 1934-1936.—National Industrial Conference Board, Inc., 247 Park Ave., New York, 1937. 137 *pp.*, 52 *tables*, 9 *charts.* $3.50.

This is the twelfth in a series of studies by this board on the cost of government. The problem, which has become ever more serious during the past few years, is summarized here in an accurate and understandable form. All recent significant data are clearly presented and weighed as to future implications. The four sections of the volume are entitled "Governmental Expenditures," "Tax Collections," "The Federal Deficit," and "Public Debt." Appendices A and B give sources and methods for the study.

Technological Trends

A tremendously fascinating and valuable work of the National Resources Committee entitled "Technological Trends and National Policy" is just off the press. Its purpose is to point out various recent inventions of significance and to analyze their potential effects on life and work in America. Changing conditions will bring new problems, problems which should be met by a national effort to enhance benefits and minimize social suffering and loss. The three sections of this volume are entitled "Social Aspects of Technology," "Science and Technology," and "Technology in Various Fields." Readers concerned with city problems should find the sections on transportation, communication, power, electricity, and construction particularly interesting. As inventions in the past have fundamentally altered the aspect of our cities, so may future inventions change the tide and inundate our present conceptions of civilized living. 388 pp. $1.00. (Apply to Supt. of Documents, Washington, D. C.)

Status of Housing Projects

The Housing Division of the PWA has published "Status of Projects—June 1, 1937," which describes the present stages of completion of the various housing projects in its national demonstration program. Techwood and University Homes in Atlanta, Ga., Stanley S. Holmes Village in Atlantic City, N. J., William B. Paterson Courts and Riverside Heights in Montgomery, Ala., Liberty Square in Miami, Fla., and Parklawn in Milwaukee, Wis., are now completed and occupied. 28 pp. (Apply to the Housing Division, Federal Emergency Administration of Public Works, Interior Building, Washington, D. C.)

New York Municipal Government

"Guide to the Municipal Government, City of New York," Third Edition, by Rebecca B. Rankin, has been recently published. The purpose of this latest revision is to describe in detail the government of the city as it will operate under the new 1938 City Charter. Every conceivable department is analyzed individually and in its relation to other departments, giving a complete and clear picture which should be valuable to student and interested citizen alike. A great many of the laws presented as in force in the city do not appear in the new Charter, which is merely an outline of governmental structure. These laws are being codified, however, and will be introduced in the State Legislature late in 1937 for ratification as the "Administrative Code of the City of New York." 106 pp. $1.25. (Apply to the Eagle Library, Inc., Eagle Building, Brooklyn, N. Y.)

City-County Buildings

"City-County Buildings, Construction and Operation of Buildings Used Jointly by Cities and Counties" presents the experience of 13 representative municipalities and counties of this country in the joint ownership of public buildings. Information is given on the distribution of cost, ownership, management, and the allocation and use of space. 25c. (Apply to the American Municipal Association, Drexel Ave. and 58th St., Chicago, Ill.) See p. 105.

The Library Trustee

The Library Trustee.—By Anna Gertrude Hall. American Library Association, 520 N. Michigan Ave., Chicago, Ill., 1937. *xiii* + 180 *pp.* $2.35.

There are certain standard questions which enter into the mind of every new servant on a board of library trustees. To make life a little simpler for the novice in this task, the above volume has been prepared, giving the best possible amalgamation of opinion on the various fundamental problems of library administration. Naturally such a manual cannot be taken as gospel for all libraries when circumstances are so varied, but any lay library board should find it a guide to the general underlying principles of its relationship to the institution under its control.

Roadside Development

The "Report of the Joint Committee on Roadside Development of the American Association of State Highway Officials and the Highway Research Board, 1936" has just been published, containing a record of the two open meetings of this joint committee during 1936. Summaries of the general papers on roadside development problems are given, and the reports and discussions on the major research projects of the committee: erosion, plant materials, zoning, highway types and roadside areas, and education and public relations, are presented. 86 pp. 25c. (Apply to the Highway Research Board, National Research Council, Washington, D. C.)

Municipal Construction

"Model Detailed Specifications for Municipal Construction," publication 7-A of the New York State Conference of Mayors, has been revised up to June 1, 1937. Extensive changes have been made, particularly in specifications of materials and in pavement construction. The complete volume covers materials, grading and pavement construction, sewer construction, sidewalk construction, special and miscellaneous structures and operations, and water main construction. The specifications are based largely upon construction standards formulated by the Division of Engineering of the city of Rochester, carefully reviewed by a number of well-known engineers. A policy of approving only those new provisions which have been demonstrated practicable through actual municipal experience is followed, which means that some of the latest innovations do not receive consideration. 220 pp., loose-leaf form to permit insertion of new material. (Apply to the New York State Conference of Mayors and Other Municipal Officials, City Hall, Albany, N. Y.)

National Recreation Congress

The "Proceedings of the Twenty-Second National Recreation Congress" is a published report of the conference which took place from May 17 to 21, 1937, in Atlantic City. The general theme of the conference was "The Importance of Recreation in Modern Life," and the enthusiasm of the participants in the discussions demonstrated the growing acceptance of this importance. The reproduction of the proceedings contains the papers presented in the general sessions and records of the topics covered in the various discussion groups, covering practically every phase of the recreation question. An interesting feature of the Recreation Congress was the Consultation Corner where over 500 individual conferences were held with people seeking help and information on special problems. 151 pp. (Apply to the National Recreation Association, 315 4th Ave., New York.)

Bibliography on Probation

Caroline Shurtleff Hughes, Readers' Adviser of the Public Library, Washington, D. C., has prepared an "Annotated Bibliography on Probation" for the Attorney General's Advisory Committee on Crime. Books, short articles, pamphlets, and associations and congresses on the subject are listed. 17 pp. (Apply to the Public Library, Washington, D. C.)

State Control of Local Finance

State Control of Local Finance in Oklahoma.—By Robert K. Carr. University of Oklahoma Press, Norman, Okla., 1937. *xiv* + 281 *pp.* $3.00.

This volume examines the forms of state control of local finance prevailing in Oklahoma between 1931 and 1935. As a tendency has been noted toward centralization of many other governmental functions, so finance has become increasingly an accepted province for further state control. Consequently the problem arises of formulating the most scientific system of control compatible with the home-rule consciousness of this country. The author here considers the legislative side but lays greater emphasis on the functional side of state financial supervision in Oklahoma, seeing more significance in the revelations of the latter approach. Also more attention is given the controlling agencies rather than the heterogeneous units controlled. Such subjects as assessment, local budgetary procedure, local indebtedness, accounting and auditing and grant-in-aid control are prominent in the discussion.

State Planning Boards

A publication of the National Resources Committee entitled "Status of Organization of State and Regional Planning Boards" has been revised to May 22, 1937. Summary information on the establishment, legal status and membership of the planning organizations in each state is brought up to date. 31 pp. (Apply to the National Resources Committee, North Interior Building, Washington, D. C.)

Highway Zoning

The Roadside Bulletin for June, 1937, contains a number of papers on highway zoning, prefaced by a vivid pictorial description of the bill-board-blighted highways of America. The papers are entitled "Highway Zoning or Mere Regulation—Which?," "California, Roadside Control through County Zoning," "Connecticut and Highway Zoning," "New Jersey State Planning Board Urges Highway Zoning," and "Highway Zoning through State Regulations." Concluding pages of the pamphlet record some of the latest progress in roadside control. 43 pp. 10c. (Apply to the National Roadside Council, 119 East 19th St., New York.)

Hydraulic Institute Standards

A new section of the *Hydraulic Institute Standards* has been published, entitled the "Deep Well Turbine Pump Section." It includes definitions of deep well turbine pump parts and material, conditions of sale, definitions of efficiencies and methods of testing, what to look for in the event of pumping troubles, charts and explanations of column friction losses and mechanical friction in turbine pump line shafts, description of power balance in a deep well turbine pump, air line method of determining depth of water level and method of plumbing a well. 25c separately, or furnished with complete book of Standards at $1.00. (Apply to C. H. Rohrbach, Hydraulic Institute, 90 West St., New York.)

Other Reports Received

Dubuque, Iowa.—Municipal Report, 1936-1937. 54 pp.

Milwaukee County, Wis.—"1936 Financial Summary." 128 pp.

Muscatine, Iowa.—Annual Report, Board of Water and Light Trustees, fiscal year ending March 31, 1937. 20 pp.

New York, N. Y.—"New York Advancing Toward Social Security," Department of Public Welfare. 152 pp.

New York, N. Y.—"Must We Have Slums?," New York City Housing Authority. 20 pp.

Oak Park, Ill.—Annual Report, Water Department, 1936. 25 pp.

Salina, Kans.—Annual Report of the City Clerk, 1936. 34 pp.

Seattle, Wash.—Annual Report of the Comptroller, year ending December 31, 1936. 120 pp.

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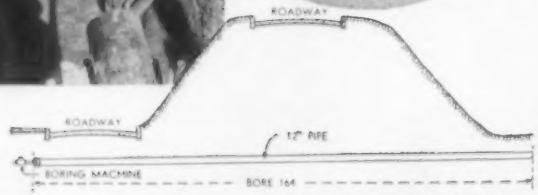

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Conventions -- When and Where

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

AUGUST 15-21.—EVANSTON, ILL. (300)
National Institute for Commercial and Trade Organization Executives. Annual meeting. (Northwestern University.) Secretary, C. R. Miles, 836 First National Bank Building, Chicago, Ill.

AUGUST 16-19.—DES MOINES, IOWA. (500)
League of Iowa Municipalities. Annual convention. (Savery Hotel.) Secretary-Treasurer, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 18-20.—DEARBORN, MICH.
American Water Works Association—Central States Section. Annual meeting. (Dearborn Inn.) Secretary, H. L. Nelson, 2122 Koppers Building, Pittsburgh, Pa.

AUGUST 23-26.—SALT LAKE CITY, UTAH.
Joint meeting. (Hotel Utah.) *International Association of Electrical Inspectors—Northwestern Section.* Secretary, F. D. Weber, P. O. Box 70, Portland, Oregon. *International Association of Electrical Inspectors—Southwestern Section.* Secretary, H. L. Gerber, Room 205, City Hall, San Francisco, Calif.

AUGUST 24-26.—SYDNEY, N. S. (250)
Union of Nova Scotia Municipalities. Annual convention. Secretary, Arthur Roberts, Bridgewater, N. S.

AUGUST 26-28.—WILMINGTON, N. C.
American Water Works Association—North Carolina Section. Annual convention. (Cape Fear Hotel.) Acting Secretary, A. R. Hollett, University of North Carolina, Chapel Hill, N. C.

AUGUST 26-28.—WILMINGTON, N. C.
North Carolina Sewage Works Association. Annual convention. (Cape Fear Hotel.) Acting Secretary, A. R. Hollett, Chapel Hill, N. C.

AUGUST 30-SEPTEMBER 3.—SPOKANE, WASH.
American Institute of Electrical Engineers. Convention. National Secretary, H. H. Henline, 33 West 39th Street, New York.

AUGUST 30-SEPTEMBER 2.—ITHACA, N. Y.
Governmental Research Association. Meeting and conference. (Willard Straight Hall on the Campus of Cornell University.) Sec.-Treas., Robert M. Paige, 850 E. 58th Street, Chicago.

AUGUST 30-SEPTEMBER 1.—ATLANTIC CITY, N. J.
National Identification Association. Annual convention. (Hotel Madison.) Secretary-Treasurer, E. W. Livingston, Jamesville, N. Y.

AUGUST 30-SEPTEMBER 2.—CLEVELAND, OHIO.
National Municipal Signal Association. Annual convention. (Hotel Statler.) Secretary, Irvin Shulsinger, 7 East 42d Street, New York.

SEPTEMBER 1-3.—BALTIMORE, MD. (400)
National Shade Tree Conference. Annual conference. (Lord Baltimore Hotel.) Secretary-Treasurer, Dr. R. P. White, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

SEPTEMBER 13-16.—BOSTON, MASS. (200)
Municipal Finance Officers' Association of the United States and Canada. Annual convention. Executive Director, Carl H. Chatters, 850 E. 58th Street, Chicago.

SEPTEMBER 15-17.—AURORA, ILL. (350)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, 500 East Capitol Avenue, Springfield, Ill.

SEPTEMBER 15-17.—SAGINAW, MICH.
Michigan Municipal League. Annual convention. (Hotel Bancroft.) Director, Harold D. Smith, Univ. of Michigan, Ann Arbor, Mich.

SEPTEMBER 16-17.—FOND DU LAC, WIS.
League of Wisconsin Municipalities. Annual convention. (Hotel Retlaw.) Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

SEPTEMBER 19-23.—WHITE SULPHUR SPRINGS, W. VA.
American Transit Association and Affiliated Associations. Annual convention. (Greenbrier Hotel.) General Secretary, Guy C. Hecker, 292 Madison Avenue, New York.

SEPTEMBER 20-22.—SANTA FE, N. MEX.
American Water Works Association—Rocky Mountain Section. Annual meeting. (LaFonda Hotel.) Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

SEPTEMBER 20-21.—VIRGINIA BEACH, VA. (500)
League of Virginia Municipalities. Annual convention. (Cavalier Hotel.) Executive Secretary, Morton L. Wallerstein, 902 Travelers Building, Richmond, Va.

SEPTEMBER 21-24.—POLAND SPRING, MAINE. (600)
New England Water Works Association. Convention. (Poland Spring House.) Secretary, Frank J. Gifford, 613 Statler Building, Boston, Mass.

SEPTEMBER 22-23.—RICHMOND, KY. (250)
The Kentucky Municipal League. Annual meeting. Executive Secretary, Carl B. Wachs, Municipal Building, Lexington, Ky.

SEPTEMBER 27-30.—BOSTON, MASS.
American Association of State Highway Officials. Convention. (Statler Hotel.) Exec. Sec., W. C. Markham, 1220 National Press Bldg., Washington, D. C.

SEPTEMBER 27-30.—FORT WORTH, TEXAS.
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, Will O. Doolittle, Box 422, Tulsa, Okla.

SEPTEMBER 27, WEEK OF.—WHITE SULPHUR SPRINGS, W. VA.
Illuminating Engineering Society. Annual convention. (Hotel Greenbrier.) General Secretary, A. D. Cameron, 51 Madison Ave., New York.

SEPTEMBER 27-28.—WINSTON-SALEM, N. C.
North Carolina League of Municipalities. Annual convention. (Robert E. Lee Hotel.) Executive Secretary, Patrick Healy, Jr., Capital Club Building, Raleigh, N. C

OCTOBER 2.—CONCORD, MASS. (200)
Massachusetts Federation of Planning Boards. Planning conference. (Concord Inn.) Secretary, Gilbert Robinson, 38 Garfield Avenue, Medford, Mass.

OCTOBER 4-6.—ATLANTA, GA. (350)
American Public Works Association. Congress. (Atlanta Biltmore Hotel.) Executive Director, Frank W. Herring, 850 East 58th Street, Chicago.

OCTOBER 4-8.—OTTAWA, ONT. (300)
Civil Service Assembly of the United States and Canada. Annual meeting. (Chateau Laurier.) Dir., G. Lyle Belsley, 850 58th Street, Chicago.

OCTOBER 4-7.—BALTIMORE, MD.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Wilmington, Del.

OCTOBER 5-8.—NEW YORK.
American Public Health Association. Annual meeting. Executive Secretary, Dr. Reginald M. Atwater, 50 West 50th Street, New York.

OCTOBER 5-8.—NEW YORK.
Conference of State Sanitary Engineers. Meeting. (Hotel Pennsylvania.) Secretary-Treasurer, R. E. Tarbett, United States Public Health Service, Washington, D. C.

OCTOBER 5-7.—OMAHA, NEBR.
League of Nebraska Municipalities. Annual convention. (Hotel Fontenelle.) Sec.-Treas., C. E. Beals, 204 Brownell Bldg., Lincoln, Nebr.

OCTOBER 10-12.—KANSAS CITY, MO. (100)
Institute of Traffic Engineers. Annual meeting. (Hotel President.) Secretary-Treasurer, Harold F. Hammond, 1 Park Avenue, New York.

OCTOBER 10-15.—PHILADELPHIA, PA.
American Prison Association. Annual congress. (Hotel Bellevue-Stratford.) General Secretary, E. R. Cass, 135 East 15th Street, New York.

OCTOBER 11-16.—BALTIMORE, MD.
National Association of Public School Business Officials. Annual convention. (Lord Baltimore Hotel.) Secretary, H. W. Cramblet, Board of Education, Pittsburgh, Pa.

OCTOBER 11-15.—KANSAS CITY, MO.
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 13-15.—ATLANTIC CITY, N. J. (200)
Pennsylvania Water Works Association. Annual meeting and convention. (Haddon Hall.) Secretary, Dr. F. Herbert Snow, 327 Telegraph Building, Harrisburg, Pa.

OCTOBER 15-16.—ATLANTIC CITY, N. J.
American Water Works Association—New Jersey Section. Meeting. Secretary, P. S. Wilson, 325 Washington Street, Glen Ridge, N. J.

OCTOBER 15-16.—ELMIRA, N. Y.
New York State Sewage Works Association. Fall meeting. (Hotel Mark Twain.) Secretary-Treasurer, A. S. Bedell, State Department of Health, Albany, N. Y.

OCTOBER 18-21.—AUSTIN, TEXAS.
American Water Works Association—Southwest Section. Annual meeting. (Driskill Hotel.) Secretary-Treasurer, Lewis A. Quigley, 3320 West Berry Street, Fort Worth, Texas.

OCTOBER 18-21.—NEW ORLEANS, LA.
International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 850 East 58th Street, Chicago, Ill.

OCTOBER 19-22.—OKLAHOMA CITY, OKLA.
International Association of Fire Chiefs. Annual conference. (New Municipal Auditorium.) Secretary, James J. Mulcahey, 16 Franklin Avenue, Yonkers, N. Y.

OCTOBER 19-20.—CINCINNATI, OHIO.
Ohio Conference on Sewage Treatment. Annual convention. (Netherland Plaza Hotel.) Sec., B. M. McDill, Dept. of Health, Columbus, Ohio.

OCTOBER 20-23.—SACRAMENTO, CALIF.
American Water Works Association—California section. Annual meeting. (Senator Hotel.) Secretary-Treasurer, Carl M. Hoskinson, Chief Engineer, Division of Water, Sacramento, Calif.

OCTOBER 20-23.—NEW YORK. (200)
National Association of Assessing Officers. Annual convention. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

OCTOBER 24-27.—BUFFALO, N. Y.
National Association of Commercial Organization Secretaries. Annual meeting. (Hotel Statler.) Sec.-Treas., R. W. Nelson, Chamber of Commerce, Cincinnati, Ohio.

OCTOBER 25-27.—DODGE CITY, KANS.
League of Kansas Municipalities. Annual convention. (Lora Lock Hotel.) Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 25-28.—BALTIMORE, MD.
National Tax Association. Annual conference. (Lord Baltimore Hotel.) Secretary, W. G. Query, South Carolina Tax Commission, Columbia, S. C.

OCTOBER 27-29.—WHITE SULPHUR SPRINGS, W. VA.
American Institute of Steel Construction, Inc. Annual convention. (Greenbrier Hotel.) Secretary, V. G. Iden, 200 Madison Avenue, New York.

OCTOBER 28-30.—ST. PAUL, MINN.
American Water Works Association—Minnesota Section. Annual meeting. Secretary-Treasurer, Ronald M. Finch, 414 Flour Exchange, Minneapolis, Minn.

NOVEMBER 4-6.—OMAHA, NEBR.
American Water Works Association—Missouri Valley Section. Annual meeting. (Hotel Fontenelle.) Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

NOVEMBER 4-6.—RICHMOND, VA.
American Water Works Association—Virginia Section. Annual meeting. (Jefferson Hotel.) Secretary, H. W. Snidow, 601 State Office Building, Richmond, Va.

NOVEMBER 8-10.—GREEN BAY, WIS.
American Water Works Association—Wisconsin Section. Annual meeting. (Hotel Northland.) Secretary, L. A. Smith, City Hall, Madison, Wis.

NOVEMBER 18-20.—ROCHESTER, N. Y.
National Municipal League. Annual meeting. (Seneca Hotel.) Secretary, Howard P. Jones, 309 East 34th Street, New York.

DECEMBER 6, WEEK OF.—MEMPHIS, TENN.
The Asphalt Institute. Conference. Managing Dir., J. E. Pennybacker, 801 Second Ave., N. Y.

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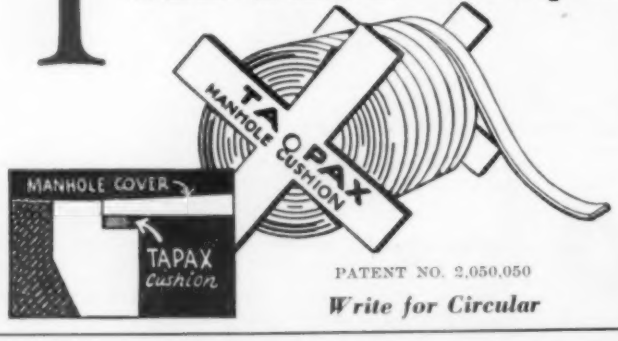

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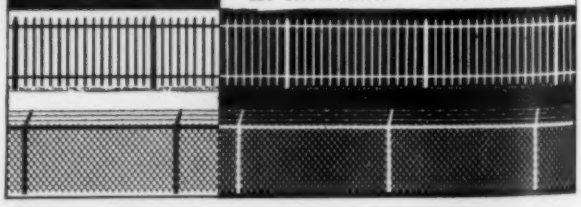

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Harrison P. Eddy, Sewage Expert, Dies

Harrison Prescott Eddy, of the firm of Metcalf & Eddy, Boston, Mass., long known nationally and internationally as a leading consulting sanitary engineer, particularly in the sewage field, died in Montreal while attending the semi-centennial meeting of the Engineering Institute of Canada, where he was to have been awarded an honorary membership in the Institute.

Mr. Eddy, who was a past president of the American Society of Civil Engineers, was born in Millbury, Mass., and following his graduation from Worcester Polytechnic Institute in 1891 became superintendent of the sewage treatment plant at Worcester, Mass. In 1907 with Leonard Metcalf he founded the Boston consulting firm of Metcalf & Eddy. He advised many industries and cities on problems of sewage treatment and water supply, including those of Los Angeles, San Francisco, Milwaukee, New Orleans, Chicago, Detroit, Buffalo, Pittsburgh, Rochester, Washington, Toronto and Portland, Ore. He was a member of the American Society of Civil Engineers, Boston Society of Civil Engineers, American Water Works Association, New England Water Works Association, American Public Health Association and numerous other leading engineering institutes and societies.

Water Works Journal Resumes Publication

Pittsburgh Equitable Meter Co., Pittsburgh, Pa., resumed publication of the *Water Works Journal* with an issue in June for distribution at the American Water Works Association Convention in Buffalo. This house organ was a regular feature of water-works literature for many years, containing much of interest and value to water-works engineers and operators. Its return to the field will be welcomed by the officials everywhere.

World's Fair Contract for Cyclone Fence

Immediate enclosure of the 389.8 acres comprising the central exhibit area of the New York World's Fair has been made necessary two years in advance of the exposition's opening date by the increasingly great and varied construction work. On May 31, the award of a first contract for 9-foot steel fencing to the Cyclone Fence Co., 370 Lexington Avenue, New York, will result in the immediate production of the necessary material at the Waukegan, Ill., plant of the company.

About three miles of fencing are required to enclose Section 1 of the 1,216½-acre site along three sides and down to the Flushing River, which provides the eastern barrier.

E. H. JOERN, OF THE MUELLER BRASS CO.

Joern to Represent Mueller Brass in St. Louis

The Mueller Brass Co., Streamline Pipe and Fittings Division, has recently appointed E. H. Joern as its St. Louis Representative. Mr. Joern has had about fourteen years' experience in the water-works and plumbing and heating fields on promotional work with water-works officials, architects and plumbing and heating contractors in and around the St. Louis area. He has spent considerable time in the Streamline Laboratories and plant at Port Huron, Mich. His address will be 4067 Park Avenue, St. Louis, Mo.

Sheets Becomes President of Portland Cement Association

Announcement has been made of the election of Frank T. Sheets as President of the Portland Cement Association, to become effective September 1, succeeding Edward J. Mehren, who recently resigned. Mr. Sheets for the past four years has been Consulting Engineer and Director of Development for the Association. Previous to that, he was associated with the Illinois Highway Department for 23 years, for 12 of which he was Superintendent of Highways and Chief Engineer, during which time he directed expenditure of over $450,000,000 and supervised the construction of approximately 11,600 miles of highways, of which 8,356 miles were primary roads.

Mr. Sheets has served as President of the American Association of State Highway Officials, of the Mississippi Valley Highway Conference, and of the Central Illinois Section of the American Society of Civil Engineers. He was an official delegate from the United States Government to the Pan-American Highway Congress at Rio de Janeiro in 1929. His experience in the highway field covers practically all phases of highway financing, design, construction, maintenance and administration. During the past few years he has directed the administrative and technical policies of the Highways Bureau of the Association, and the industrial research to develop new and improved uses of portland cement and concrete, in addition to performing his duties as consulting engineer.

BEAUMONT, TEXAS, HAS FOUND HARLEY-DAVIDSON SERVI-CARS INVALUABLE IN CAR MARKING AND TRAFFIC PATROL WORK

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Sewer-Rental Laws

A Study of Revenue Bond Acts and the Sewer-Rental Situation in the 48 States

IF you want information on rates, methods of handling sewer rentals, billing, the advantages of this method of financing and a complete summary of the laws as they exist in each one of the States, you should have a copy of this 24-page report. Sewer rentals are charged in some cities by authority of state-wide laws, in others by special acts, some by charter provisions and others go it alone.

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AN INSTALLATION OF THE JEFFREY WAYTROL FOR THE APPLICATION OF CHEMICALS IN A MUNICIPAL WATER WORKS

Weighing and Feeding Water-Works Chemicals

The Waytrol constant-weight feeder is a precision machine made by the Jeffrey Manufacturing Co., of Columbus, Ohio, to continuously weigh and feed such materials as water-works chemicals. It consists of an all-electric vibrating feeding device, a synchronous weigh-belt on a scale beam so pivoted as to receive material at the more sensitive end, and an automatic all-electric control sensitized through a device called "electric brain." In this machine, feeding and weighing are physically separated processes. The rate of feed to the weigh-belt is in no way dependent on the volume of material handled. The rate of feed is governed directly by weight through the electric brain, which registers any slight unbalance of the belt and makes instant correction by speeding up or slowing down the vibrating feeder.

On the scale of the weigh-belt beam is an adjustable counterpoise. With the counterpoise at zero, the weigh-belt, empty, is in perfect balance. Setting of the counterpoise away from zero establishes the weighing rate. Once set at a given weighing rate, the feeder thereafter will automatically maintain it, regardless of density or moisture change.

Discharge from the weigh-belt is to a fixed chute in the base frame. A wiper prevents sticking of the material on the belt. The belt is enclosed in an aluminum housing which is integral with the beam. Being sensitized by the electric brain, which is coupled to and serves as the nerve center of the balancing system, the control panel of the feeder may be located in any convenient place. Flasher lights are located on the front of the control box to give visual evidence of correct operation.

Waytrols are available in sizes handling a few pounds up to many tons per hour. The smallest unit will handle granular chemical material weighing 100 pounds per cubic foot at a rate that can be varied from several pounds to a maximum of 4,000 pounds per hour. These units are claimed to weigh to within 1 per cent of absolute at least, and in many cases exceed this accuracy. They all operate from any standard 60-cycle lighting circuit.

Bulletin No. 644 issued by the Jeffrey Manufacturing Co., 970-99 North Fourth Street, Columbus, Ohio, describes the Waytrol constant weight feeder in detail. Copies may be secured direct from the manufacturer free on request by mentioning THE AMERICAN CITY.

Returning Flooded Turbine to Service

While the crest of last winter's flood in the Ohio Valley reached a level some 14 feet above the highest previous record, the operators of the Riverside pumping station, Louisville, Ky., were successful in keeping pumps going and the city reservoirs supplied. When the motor-driven pump and the boiler room had been drowned out, one unit was still kept turning over by using steam from a river steamboat moored alongside the pump house, and, as the water receded, the 40-mgd De Laval geared turbine-driven centrifugal pump was quickly reconditioned and returned to service, although it had been under 35 feet of water for some ten days.

Subsequently, after the electric motor of the 60-mgd De Laval motor-driven unit had been returned from the factory, where it was re-wound, it again took over the main pumping load. An account of how rapidly mounting difficulties were each in turn successfully overcome is related in a leaflet which is being distributed by the De Laval Steam Turbine Co., Trenton, N. J. This leaflet contains airplane and other views of the flooded station and will be sent to readers of THE AMERICAN CITY free on request.

Sewage Sludge Gas Engines

The gas generated during the digestion of sewage sludge was considered of no value in the early days of sewage treatment, and was burned to prevent obnoxious odors. Now the gas is partially used to heat the sludge in the digestion tanks and as a fuel for gas engines. Sludge gas is an excellent fuel for the operation of gas engines, for it contains a large percentage of methane and has an average heat value of approximately 600 Btu. Gas as collected from the digestion tanks can be used in some locations without scrubbing. But where the H_2S content exceeds 5 grains per 100 cubic feet of gas, it is recommended that scrubbers be used to clean the gas.

The Worthington Pump & Machinery Corporation, Harrison, N. J., has developed a line of gas engines, including units from 15-hp to 1,800-hp to be driven by sludge gas. These engines are conservatively rated for continuous operation under full load and may be direct-connected to generators or blowers and can also be used for direct-connection or gear-drive sewage pumps. A special feature of these engines is that they may be quickly converted for the use of fuel oil to supply the energy if at any time sludge gas is not available. This is particularly advantageous in new plants where the power used in the plant is to be supplied by sludge gas, which is never available for several months after the plant is started. During this period the Worthington engines may be operated as fuel oil engines, and then shifted over to operation with sludge gas when there is a sufficient quantity of gas of the proper quality available.

The amount of power available from sludge gas varies in different plants. An average of 0.6-cubic foot of gas in 24 hours per capita is a conservative figure. The following example gives the approximate amount of power that can be developed from sewage sludge gas with a gas engine. In a city of 100,000 population and with sludge gas of average heat value, about 600 Btu, and allowing 0.6-cubic foot of gas in 24 hours per capita and with 10,000 Btu required per hp per hour, it is possible to develop 150 bhp.

$$\frac{100{,}000 \times 0.6 \times 600}{24 \times 10{,}000} = 150 \text{ bhp developed}$$

A 300-hp Worthington CG5 gas engine connected through an angle gear to a Worthington sewage pump is used in the Cadiz Street sewage-treatment plant, Dallas, Texas. A 30-hp Worthington AG2 gas engine drives a generator in the sewage-treatment plant at Janesville, Wis., furnishing general-purpose electric power. A 300-hp CG5 gas engine drives a generator in the sewage-treatment plant of the Greater Peoria, Ill., Sanitary and Service Disposal District, supplying power for all motor-driven equipment in the plant. A 535-hp DG6 sewage-gas engine is direct-connected to a rotary blower through a floating shaft and is used for aerating sludge in the last treatment process at the Peoria, Ill., plant. Other installations have been made at Cedar Rapids, Iowa, the Coney Island sewage-treatment station, New York City, Springfield, Ill., Topeka, Kans., Ann Arbor Mich., Richmond, Ind., Kewanee, Ill., Hutchinson, Kans., La Crosse, Wis., Kokomo, Ind., Elmhurst, Ill., Green Bay, Wis., and Sheboygan, Wis.

Syntron Outgrows Old Quarters

On June 11, Syntron Company, formerly located at 400 North Lexington Avenue, Pittsburgh, Pa., moved to a new and larger factory at Homer City, Pa. This company manufactures electric hammers, tie tampers, gas-electric power units, electric vibrators, Vibra-flow feeder conveyors for water-works chemicals, and other similar equipment.

Heil blade of "V" type snow plows convert dependable Heil dump trucks into efficient snow plow units—Heil snow plows are made in a variety of sizes and types for mounting on any truck—For complete specifications and specific recommendations see your nearest Heil representative or address:

THE HEIL CO.

GENERAL OFFICES: 3000 W. MONTANA ST., MILWAUKEE

FACTORIES: MILWAUKEE, WISCONSIN; HILLSIDE, NEW JERSEY

BRANCHES AND DISTRIBUTORS EVERYWHERE

HEIL Quality PRODUCTS

HOISTS - BODIES - TANKS
ROAD SCRAPERS - SNOW PLOWS
BOTTLE WASHERS - DEHYDRATORS
OIL BURNERS - WATER SYSTEMS

To trim or not to trim

When you use Simplex-FIBREX Tree Wire this question is automatically answered because with FIBREX, trees do not have to be cut and trimmed. Simplex-FIBREX has a tough, abrasion resistant fibre armor that resists indefinitely the rubbing and swaying of branches and limbs.

It does not need bulky wooden battens or porcelain insulators to protect it from abrasion. The outer covering of FIBREX is highly abrasion resistant and is non-inductive.

Notice in the cut below how well the new FIBREX is constructed. We will be glad to send you a sample upon request.

Simplex Wire & Cable Co.
79 Sidney Street
Cambridge, Mass.

KILLS BURDOCK

BURDOCK with its long taproot is tough—but not tough enough to stand up against Dolge Weed Killer. This chemical is so powerful that a 1-to-20 solution completely kills not only burdock but also wild morning glory, crab grass, horsetail, thistles, nettles and other hardy growth—even poison ivy gives up the ghost when Dolge Weed Killer is applied according to simple directions. Of course, ordinary growth stands no chance at all. A 1-to-40 solution drives it off your drives—off walks, gutters, tennis courts, sand traps, baseball infields, running tracks.

DOLGE WEED-KILLER

The C. B. Dolge Co. Westport, Conn.

Novel Device Measures Carbon Dose Required

The actual choice of the proper amount of activated carbon to be used by a water-works operator to reduce a taste or odor to a point where it will not be noticeable to the consumer, has been a matter of trial and error, with the first trials on the side of safety—or doses far larger than necessary. A novel device has been developed by the Darco Corporation, 60 East 42nd Street, New York, for determining the amount of activated carbon necessary to produce the desired results.

While the development of this device, known as the Darcograph, has involved the use of complicated formulae and logarithmic paper, the use of the device in water-works practice is very simple.

The Darcograph consists of a sheet of specially ruled graph paper and a scale rule. All that the operator has to do is to make several tests of the water, using varying amounts of activated carbon, and plot the results carefully, as instructed in a well-prepared booklet which completely explains how the Darcograph has been developed and how it is used. The results obtained make it possible for a water-works operator to select immediately the dosage necessary to obtain a particular residual threshold odor. It has the further advantage of making it possible for the operator to compare two activated carbons to determine which works more effectively on the water treated at his plant.

The Darco Corporation has offered to send a block of the graph paper, the Darco scale and the instruction booklet without cost, to municipal water-works officials or engineers, if they will write direct to Walter A. Helbig, Assistant Engineer, Sales Division, Darco Corporation, 60 East 42nd Street, New York, and mention THE AMERICAN CITY.

Radio Noise Finder in Portable Form

A portable instrument capable of indicating quickly and accurately the many points at which extraneous radio frequency fields originate, has been announced by Tobe Deutschmann Corporation, Filterette Division, Canton, Mass. The Model 233 noise and fault locator is 12 inches long, 12 inches high, and 7½ inches wide. Within the compact box are all the batteries, tubes, controls, the output meter, and even a compact loud speaker.

Being entirely self-contained, the instrument may be used in any automobile without special installation provision, and may easily be removed from the trouble car at any time for checking the many potential noise sources or faults which might otherwise remain unidentified because of their location at points inaccessible to an automobile.

THE TOBE MODEL 233 NOISE AND FAULT LOCATOR

The unit weighs only 23 pounds fully equipped and ready for operation. It is particularly valuable for use in locating high-line troubles and for investigating noise sources on consumers' premises. It is contained in a welded cabinet of sheet steel having weather-resisting black, baked enamel finish, and the chassis of the instrument as well as shielding and most other metal parts are of aluminum.

Only two controls are required for operating this Tobe noise and fault locator, namely, the noise selector and the sensitivity adjustor. The noise selector allows adjustment of the instrument to maximum response at the desired frequency, while the sensitivity adjustor enables the operator to obtain whatever degree of sensitivity is required for checking noise fields of any intensity up to 200,000 microvolts. The control is provided with a graduated scale so that sensitive settings may be duplicated at any time.

An input switch enables the operator to connect the antenna directly to the audio frequency circuit of the locator for the purpose of checking the extent of low-frequency fields which cause inductive interference with telephone, telegraph and signal systems. The antenna supplied for use with this locator is a collapsible steel rod having an overall length of 8 feet when fully extended, and a length of 28 inches when its four sections are telescoped together.

Deere Purchases Killefer

Announcement has been made by Deere & Co., Moline, Ill., of the purchase of the Killefer Manufacturing Corporation plant in Los Angeles, Calif. The acquisition of the Killefer factory, the products of which are mainly heavy-duty farm and road-building equipment, gives Deere & Co. the additional facilities needed to keep pace with its rapidly expanding business in the Pacific Coast territory.

It is the intention of the company to operate the business of the Killefer Manufacturing Corporation substantially as it has been in the past, with no changes in personnel. O. P. Robb, Vice-President and General Sales Manager for many years, will continue in that capacity.

NEW DODGE POLICE PATROL

The new Dodge emergency patrol shown above is the latest vehicle of its type featured by the Dodge Division of Chrysler Corp. This special body is mounted on a 1½-ton Dodge truck chassis and is capable of high-speed and quick stops with safety, due to its being a well-balanced unit equipped with hydraulic brakes. Vertical rails on either side of the rear door and a wide step permit one or two officers to ride there. It seats twelve passengers comfortably

Baker Mfg. Co. Vice-President Dies

J. G. Miller, Vice-President and Sales Manager of the Baker Mfg. Co., of Springfield, Ill., died recently after a two months' illness. Mr. Miller, who was 55 years old, had been associated with the Baker Mfg. Co. since its incorporation in 1908, having been one of its organizers and its first secretary. For many years he was in charge of the company's purchasing and production and for the past fifteen years was in charge of sales.

Evleth Joins Brown Instrument Co.

E. B. Evleth, affiliated with the Minneapolis-Honeywell Regulator Co. for twelve years, has been appointed Vice-President and General Manager of the Brown Instrument Co., a division of Minneapolis-Honeywell in Philadelphia.

An Achievement in Traffic Control

The NEW TYPE D *Simplified* Traffic Controller

. . . .will allow you more controlled intersections for less money.

You will be able to extend your control of traffic with this new, low-priced controller. It offers definite economy with complete flexibility because

It's *Simplified* for

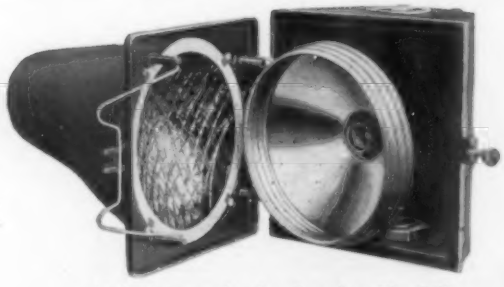
- **Low First Cost**
- **Ease in Installing**
- **Low Operating Cost**
- **Minimum Maintenance**

CHECK THESE FEATURES

- 40- to 180-second cycle range
- Up to 16 cycle divisions
- Completely variable color periods
- Controls up to 15 circuits
- Operates either alone or interconnected

Does a Complicated Job in a Simple Manner

and a Signal that is Flexible in Application



Unit Construction for Complete Flexibility

THE NOVALUX SECTIONAL TRAFFIC SIGNAL

It's built in unit sections that are adaptable to every traffic-signal use. This signal will meet all your present-day requirements and provide flexibility for the future.

Any number of color combinations
All types of mounting and suspension
Adjustable to any street angle

For complete information write to General Electric Company, Schenectady, N. Y.

500-210

GENERAL ELECTRIC

INSTALLING THE NEW GOODRICH PREFORMED RUBBER EXPANSION JOINT

New Preformed Rubber Expansion Joint Filler

A new type of rubber expansion joint filler for joint openings in concrete highways, curbs, sidewalks, structures and similar types of construction has recently been announced by the B. F. Goodrich Co., Akron, Ohio. These preformed strips are made of rubber especially compounded for age- and wear-resisting qualities. They are designed with flexible lips on both sides which project upward against the concrete surface of the joint opening, making their removal very difficult.

The strips are designed to be placed under partial compression, as they are made about 25 per cent wider than the opening to be filled, permitting the rubber to follow the concrete as it contracts, and yet compress readily when the concrete expands. In order that the strips may be easily compressed for placing in position, they are made with a large tubular opening in the center. The top surface is slightly indented or grooved to provide for downward thrust of surface upon compression. Owing to this latter feature, it is impossible for the joint material to extrude above the wearing surface of the pavement.

The recommended use is to place the strips in the bottom, ends and top of the joint opening which provides a rubber gasket around the entire cross-section of the pavement or structure. These strips can also be used with the several types of joint opening devices and as seals for air cushion joints.

New Motor Grader with Built-up Power

A motor grader with a built-up power unit in place of the customary industrial tractor power plant has been announced by Austin-Western Road Machinery Co., Aurora, Ill., in its new "66" motor grader. This unit is built with a choice of four front axles; a narrow front axle is standard on the 66, but three other types are available, namely, a wide axle with straight wheels, a wide axle with leaning wheels, and a shiftable axle. This motor grader has an electric starter as standard on both gasoline and diesel motors, so that every operation can be controlled from within the operator's cab.

Hydraulic controls operate every function of the grader. The weight of the machine and engine are so distributed as to place the maximum pressure on the blade, eliminating the tendency to jar and bounce. The rear end has sufficient weight for positive traction, and pressure on the front wheels is great enough to resist side thrust. The Austin-Western anti-chatter device, exclusive on A-W graders, permits a smooth, even cut. Two powerful springs hold the circle solidly against the draft beams, preventing chatter but permitting the circle to reverse freely. The blade circle is 60 inches in diameter, insuring adequate support for both ends of the 12-foot blade at all times.

The "66" motor grader is described in Bulletin AD 1687 which may be secured direct from Austin-Western Road Machinery Co., on request.

Sewage Equipment Contract Awarded to Worthington

The New York City Department of Sanitation has awarded to Worthington Pump & Machinery Corp., Harrison, N. J., a contract for pumps and gas engines for the Tallman's Island Sewage Treatment Works, amounting to $469,000.

The contract calls for four centrifugal pumps, two with a capacity of 15 mgd each, and two of 35 mgd each, and eight gas engines ranking from 180 to 800 hp. These engines will operate on sewage gas developed by the plant. Four of the engines will drive the centrifugal pumps, and the others, rotary blowers.

Loud-Speaker Service in Fire Stations

A refinement of the fire department communications system between headquarters and the fire stations, shortening the time required for the transmission and reception of telephonic communications by eliminating any necessity for the repetition of telephoned instructions either at headquarters or in the fire stations, has been announced by the Gamewell Co., Newton Upper Falls, Mass. The Vocalarm system consists of central station control and amplifying equipment for transmitting to the fire stations, voice communications at a high audio level. Receiving units, in the form of loud-speakers, are located in the fire stations for the reception of these communications. The system is sufficiently flexible to provide for two-way and inter-communicating service with all other fire stations, if desired.

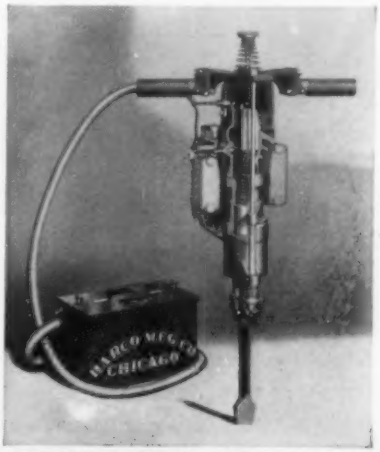
The usual fire station two-way Vocalarm installation consists of the transmitter and the necessary receiving units, or loud-speakers, usually two or more. A loud-speaker is always necessary on the apparatus floor, and others, according to the size and usage of the fire station, are located in the dormitory, reception room, repair shop, or elsewhere in the building that conditions may require. The normal condition in the fire station is that all loud-speakers are instantly responsive to attention signals and voice communications from headquarters. By a simple movement of the selector switch to another position, all loud-speakers in the fire station are disconnected except at the watch desk or on the apparatus floor. A third position of the selector switch connects the fire-station transmitter to all loud-speakers in the fire station except the speaker at the watch desk or on the apparatus floor, which remains connected to the headquarters transmitter.

Bulletin L 2029 describes the Vocalarm system in detail and illustrates the various units which comprise this new and effective means of insuring multiple reception of headquarters messages accurately.

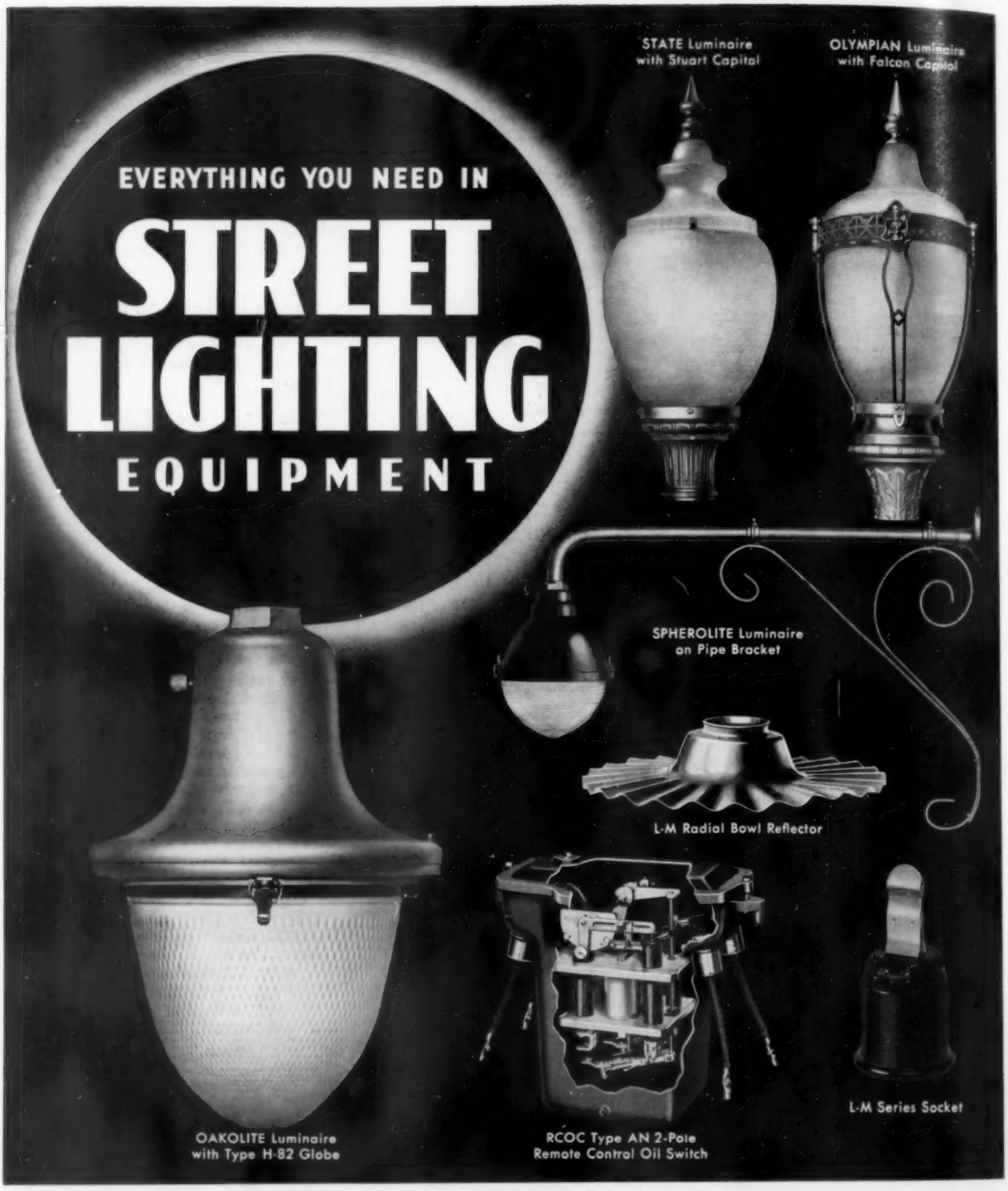
Two New Models of Portable Gasoline Hammers

Two new portable gasoline hammers, one a heavy-duty type weighing 89 pounds, and the other a lighter model weighing 70 pounds, have recently been developed by the Barco Manufacturing Co., 1801 Winnemac Avenue, Chicago, Ill. Model H-6, the heavy-duty model, is recommended for pavement and rock breaking, shallow drilling, backfill tamping, asphalt cutting, sheeting driving and general demolition work. The smaller, Model J-2, has been developed for continuous drilling, and with it there is available a complete set-up, including a small portable compressor.

The improved features of these new models include a new timing device and rearrangement of the bottom end. The tie-rod springs have been eliminated, and in place of them an internal cushion spring is used. When lifting the hammer for a new location, this spring takes the shock of the blow, materially reducing the impact shock to other parts. These changes also result in increasing slightly the power of the hammer and in reducing the vibration somewhat. A new quick-acting lock for the tool is another feature, and various other minor improvements have been made.



THE NEW BARCO PORTABLE GASOLINE HAMMER



● Whether your illumination problem involves downtown streets, a residential area, a playground or highway . . . L-M Street Lighting Equipment is the sound solution. L-M Illuminating Engineers will gladly cooperate with you in selecting and planning your installation. Write to South Milwaukee, Wisconsin, for the L-M Street Lighting Catalog and Glassware Bulletin, LMB 2361.

LINE MATERIAL CO.

Why not remember to mention THE AMERICAN CITY?

Outdoor Lighting

A Section of THE AMERICAN CITY
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Dressing Up the Business District

By R. H. COOPER
Executive Vice-President, Chamber of Commerce, Oak Park, Ill.

"BRIGHTEST and Cleanest as Well as the Largest Village in the World"—that's Oak Park, Ill., population 63,982 in 1930 and now 70,000.

To women, who give sparkle to a town, three things are of outstanding importance—the shops, the movies, and the parking space by means of which both these attractions can be enjoyed with the least inconvenience and expense.

If these three town-reputation makers are present in the daytime, they will also exist at night; but all too frequently they are murky, glamorless, profitless. We of Oak Park decided that they should be bright, lively, magnetic; and as the result of a survey made for the Chamber of Commerce by the Public Service Co. of Northern Illinois, they are more so than they were. Already some 25 of our members have remodeled their lighting, in many instances using built-in lighting effects in the modernized store fronts.

The survey furnished us with a picture of the lighting conditions in the principal two business districts, which are only an hour from the Chicago Loop. This report placed us where we could show the individual merchants what their lighting was as compared with that of their competitors.

The report, a book 20 x 30 inches, was so made that it could be shown to a group of 75 persons. In its making, every merchant who is a member of the Chamber was consulted, and the cooperation was enthusiastic. There are three main sections, having these principal features: (1) day and night views of business establishments; (2) comparison of lighting values at various stores, and before-and-after pictures of recent remodeling jobs; (3) further possibilities indicated by sketches made from field photographs, showing luminous store fronts and new-type electric signs.

The presentation of this report brought out the largest Chamber of Commerce meeting in years. Quick results were—increased lighting loads at various stores ranging from 3 to 12 kw. La Grange, Ill. (10,000 population), has asked the electric company to make a similar survey and report.

So much for store fronts, signs, and interior lighting effects, which (1) increased the night crowds, evidencing the greater pleasure of the village; (2) improved Oak Park's position in this densely-inhabited region; (3) increased business, including that of the electric company; (4) accentuated the business and social value of light rather than its cost per kwh; (5) and struck the keynote—FORWARD.

What of the Street Lighting?

Of equal importance in any such campaign and in the maintenance of results is the improvement of the street lighting. If the stores are to be made especially attractive, so also must be the ways lead-

AT OAK PARK, ILL., WHERE THE CHAMBER OF COMMERCE MADE A SYSTEMATIC DRIVE FOR MODERN STORE LIGHTING
This is the north side of Lake Street, east from Marshall Field Store

Make City Streets Beautiful DAY *or* NIGHT

HAZARD ARMORTITE CABLE

(NON-METALLIC ARMORED)

UNDERGROUND lighting systems add greatly to the appearance of streets. Hazard Armortite Cable is ideal for this purpose. Armortite is buried directly in the ground without conduits as it is protected against moisture and mechanical injury by submarine insulation, plastic sealing compound, asphalted jute coverings and non-metallic tape armor. These materials are not affected by burial in soil. Investigate Armortite before buying any underground cable.

HAZARD INSULATED WIRE WORKS

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New York Chicago Philadelphia Pittsburgh Buffalo Boston Detroit
Atlanta Seattle Dallas St. Louis San Francisco Los Angeles Washington

OAK PARK'S SURVEY RECOMMENDS A MODERN STREET-LIGHTING SYSTEM IN PLACE OF THE TYPE SHOWN HERE
Page 131 shows this location at night with new store windows on the big shop

ing to them and the streets upon which their windows look and are looked at.

Although the present street-lighting system of the business districts of Oak Park is probably above the average, it is not entirely satisfactory to the merchants who have taken a forward step in brightening their store windows. The engineers who surveyed the stores in the business districts made recommendations which call for a more modernistic and practical lighting system than the one used at the present time, and these recommendations are being forwarded to the village authorities by the Chamber of Commerce with a further recommendation that it be determined whether these new lights can be installed.

Night Driving Can Be as Safe as Day Driving

By L. A. S. WOOD
Chief Lighting Engineer, Westinghouse Electric & Manufacturing Co., Cleveland, Ohio

SAFETY campaigns, directed as they are to public education and enforcement of traffic regulations, and to better roads and improved automobile design, have had little or no effect on the night traffic accident trend, which has risen from a point in 1917 where it represented 30 per cent of all accidents to a point today where it represents nearly 60 per cent of the total.

These accident trends are significant of conditions beyond the control of the automobile driver. Safety propaganda to be successful must be accompanied by measures which will improve night visibility, such as *adequate* systems of fixed lights along the streets.

The Public Must See

The cost of traffic accidents is the largest item each citizen contributes to the maintenance of a system of thoroughfares and streets in his community, and sound economics demands a careful study of the cause of these accidents. Daytime traffic accidents are receiving adequate consideration, and definite preventive measures are being adopted, but the public in general is not yet awake to the solution of the night traffic accident problem.

Except in business districts and so-called white-way areas where super street lighting is provided, for its advertising value, the levels of street illumination *throughout the world* are far below the requirements for safety.

The annual per capita cost of street-lighting service in the United States is approximately $1.20. Many experts believe that by the expenditure of double this sum, a very minor part of the total municipal tax rate, the streets of our cities can be made as safe by night as by day. Such appropriations, however, can be made only as a result of public demand for the modernization on scientific lines of our more or less obsolete and, in general, totally inadequate street-lighting systems.

The Code of Street Lighting prepared by the Street and Highway Lighting Committee of the Illuminating Engineering Society should be the Bible of municipal officials interested in public safety at night.

Let us pause a moment to study the methods by which objects are "seen" on our streets at night. The object may be illuminated with sufficient brightness, as on business streets or in white-way areas, so that the light is reflected from it and forms on the retina of the observer a detailed image of the object. This is known as "discernment by surface detail." In minor thoroughfares and residence districts where the levels of illumination are lower and safety only is the main purpose of street lighting, we discern an object as a dark silhouette against the brighter background of the road surface. This is known as "discernment by silhouette." In this class of lighting the problem is to provide a bright road surface, not to light objects on the road.

Greater emphasis is now being placed on the visibility on the street at night,

Today's traffic congested streets have enormously complicated the work of police and fire departments. Even the most efficient departments need the help of modern electrical *public safety* equipment. When you plan for public safety, why not take advantage of Graybar's experience . . . its convenient service of supply on modern traffic control . . . Union Metal street lighting . . . Horni fire-alarm systems . . . Karpark parking meters . . . Western Electric police radio. Write us!

GraybaR Distributed and guaranteed by GraybaR ELECTRIC COMPANY Since 1869

GraybaR

OFFICES IN 83 PRINCIPAL CITIES • EXECUTIVE OFFICES, GRAYBAR BUILDING, NEW YORK, N. Y.

Do you mention THE AMERICAN CITY? Please do.

MODERN STORE LIGHTING WHICH GREW OUT OF THE OAK PARK, ILL., SURVEY
For day view of the street lamps and of the old store windows, see page 129

and its appearance, than on the amount of illumination falling on the street surface. It is now recognized that objects are seen more readily by contrast, either of color or brightness, than by direct illumination.

We recognize today that the responsibility of avoiding collisions rests to a greater degree on the automobile driver than on the pedestrian, and in modern street-lighting practice we endeavor to produce a maximum visibility for the automobile driver by producing, on the road surface, maximum surface brightness *for the automobile driver.*

The brightness of any surface containing an element of specularity is affected by the angle of incidence of the light and the angle from which the surface is viewed. This has an important bearing on modern street-lighting practice because in the modern low-built cars the eyes of the driver are located nearer the road surface than with cars of the older type, and are thus placed below the angle at which the driver can see pavement brightness with existing street-lighting systems, except in those locations where super-illumination has been provided, for its advertising value.

With New Equipment

The tendency in modern street-lighting practice is towards higher mounting and pendant luminaires with shielded light sources located as far as possible over the roadway. This modern type of street lighting, which is attractive in appearance, throws more light on the road surface, produces greater surface brightness, and enhances silhouette vision. It also tends to reduce glare.

Equipment to conform with modern street-lighting practice has been on the market for a little more than a year. The luminaire consists of an ornamental canopy to which is attached by a simple bayonet joint an extended hemispherical reflector of Alzak aluminum equipped with a pear-shaped globe. For relamping and cleaning, the reflector and globe are lowered as one unit. Globe and reflector seats are provided with substantial gaskets, making the unit dustproof and watertight. The globe is attached to the reflector by a simple holding ring and may be easily replaced while in service.

The contour of the reflector produces a wide symmetrical distribution, directing all the light in the lower hemisphere with a cut-off of from 10 degrees to 15 degrees below the horizontal, thus screening the light from the building fronts. Asymmetric distribution can be obtained by the addition of a specially designed Alzak reflector located within the globe and rigidly attached to the reflector. By the addition of this reflector, the light flux up and down the street is increased approximately three times that of the light source itself. The major part of the light is directed towards the automobile driver and reflected in his direction from the road surface, producing maximum surface brightness.

These new luminaires are made in two sizes; the smaller for lamps up to 10,000 lumens, and the larger for 15,000- to 25,000-lumen lamps. The latter may be equipped with auto transformer if desired.

Metal and concrete standards of attractive design suitable for mounting heights of 18 to 22 feet and higher are available. These are equipped with ornamental brackets which locate the luminaire well over the roadway.

Experience has conclusively established that it is impossible to enforce speeds within the limits set by visibility conditions associated with automobile headlights. Under a proper system of street lighting, however, the safety of night driving regardless of speed is as great as that by day.

The police or fire alarms may sound their calls, but unless the streets are well lighted at night, the fire apparatus, police patrols and ambulances will not arrive promptly at their destination. Crimes which may be committed at night on dimly lighted streets are difficult of accomplishment on streets which are lighted adequately.

Give the Driver Light

"Detroit is painting its pavements with white light to eliminate night automobile fatalities," says the *Schenectady Gazette* of July 2. The full story is told by L. J. Schrenk, of the Detroit Public Lighting Commission, on page 131 of THE AMERICAN CITY, March, 1937.

Service

This hydraulic-lift, fitted on a General Motors truck chassis, enables workmen to service the 1,074 sodium-vapor lamps of the San Francisco-Oakland Bay Bridge, forming the largest lighting unit of its kind in the world

The American City Professional Service Directory

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Consultants
Specializing in the Design and Maintenance of Swimming Pools
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easily and effectively from any lake, pond, reservoir, river, etc., for Water Supply, Parks, etc.
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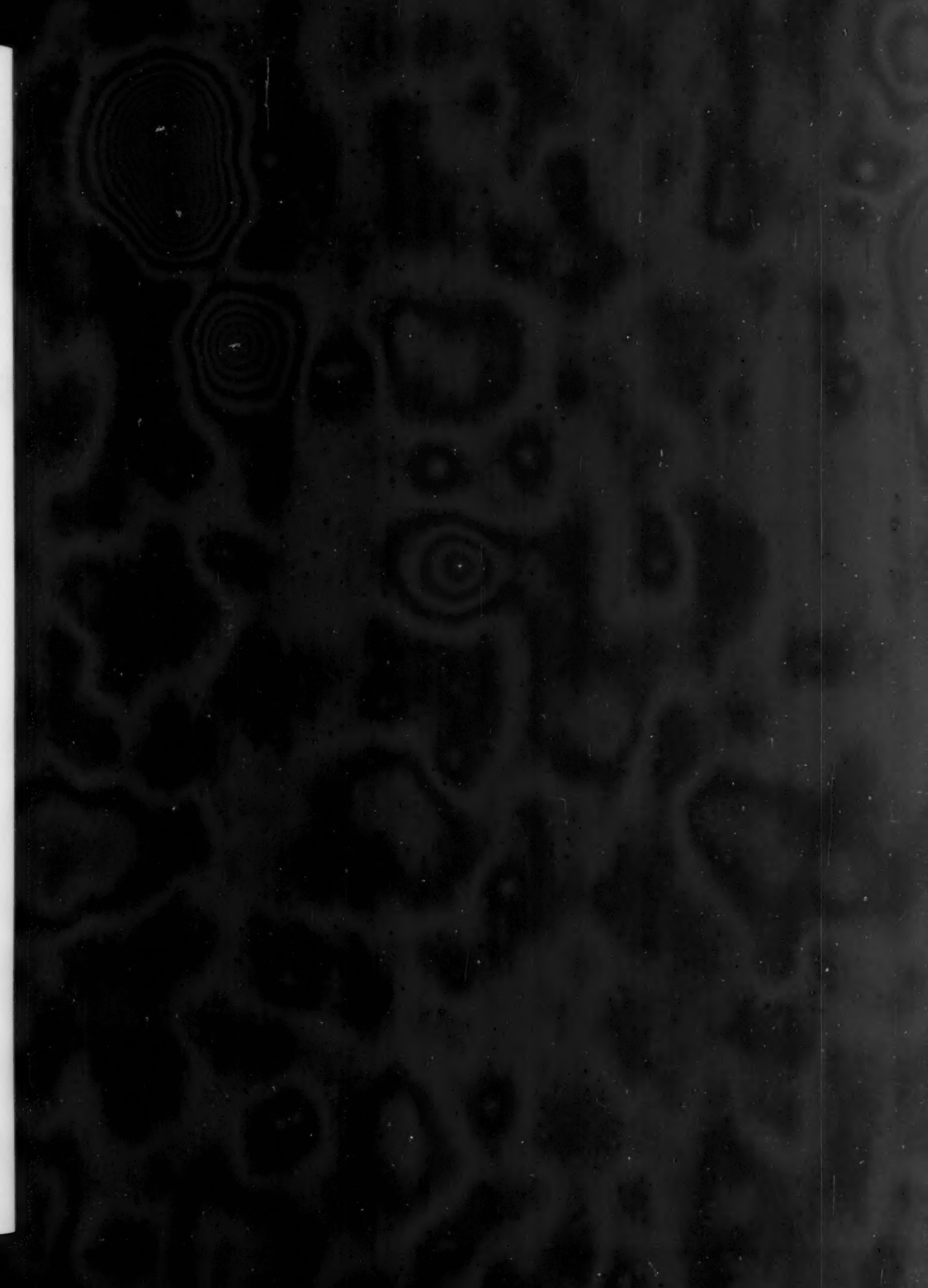

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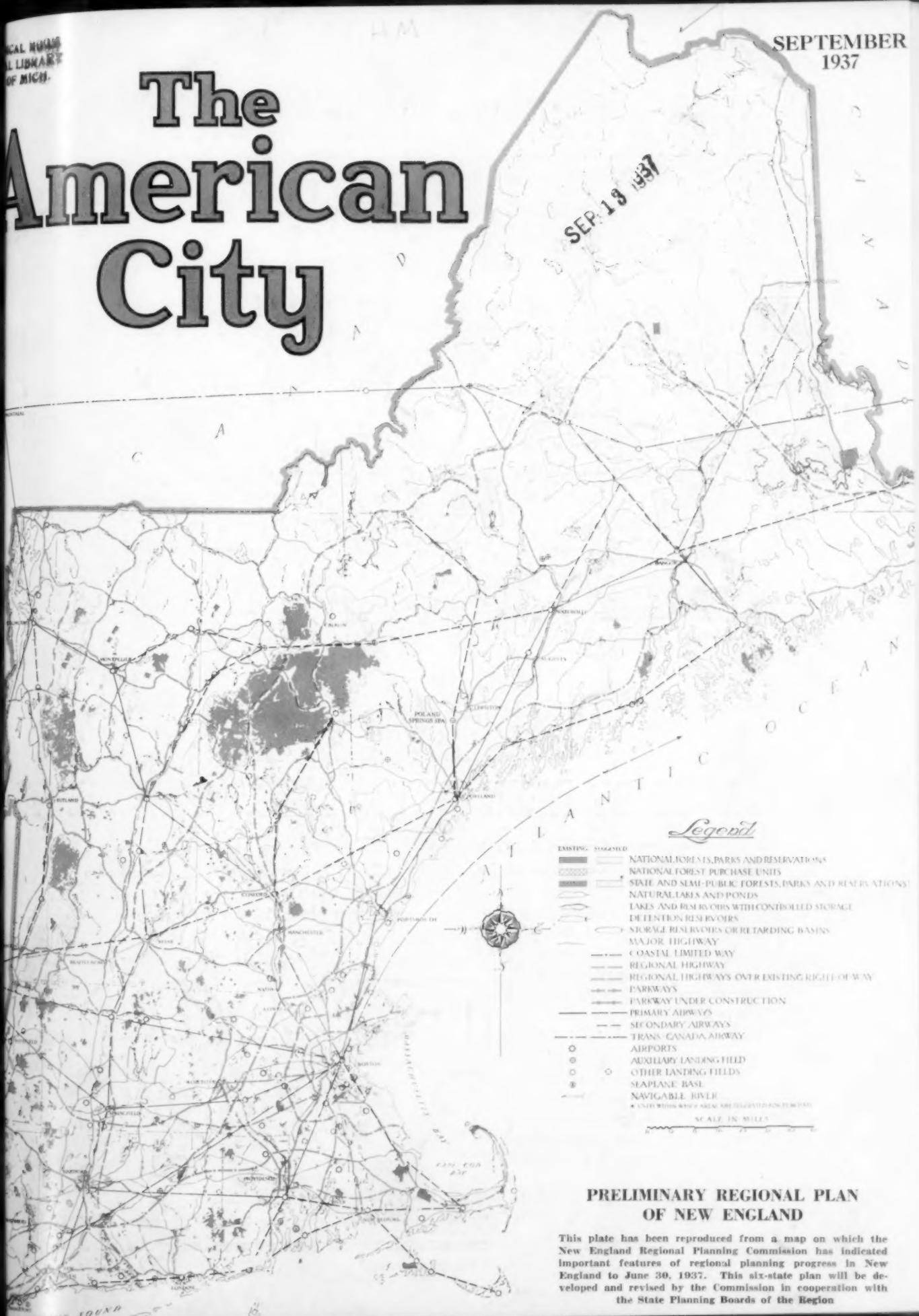

PRELIMINARY REGIONAL PLAN OF NEW ENGLAND

This plate has been reproduced from a map on which the New England Regional Planning Commission has indicated important features of regional planning progress in New England to June 30, 1937. This six-state plan will be developed and revised by the Commission in cooperation with the State Planning Boards of the Region